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Training methods of the horse: benefits and critical aspects

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## 1. Summary

Horses represent a big category of herbivores of the family of Equidae. The domestic horse descends from the wild horse, among which there is the Przewalski's horse, still existing. Wild horses began to be tamed at the end of the third millennium BC for work and as livestock for procuring food, and getting on in years they began to be ridden as means of transport and in wars and battles. Nowadays there are more than 300 horses' breeds, and they are no longer, or very little, employed for work the land, but instead for the food industry, for sports, for pet therapy and as companion animal. Since horses are now used in several fields, there is the need to take care of them with the right management and husbandry techniques, to guarantee them the maximum welfare and life. Nowadays horses are used for sport and hobbies, therefore there are lots of training methods and techniques with which they are trained, all based on the learning theory. Learning theory is divided in non-associative and associative learning: non-associative learning includes the habituation and sensitization process, while associative learning includes classical conditioning and operant conditioning. There are different techniques and training methods in the equitation world; the techniques are positive and negative reinforcement, positive and negative punishment, habituation and lunging. While the training methods are: the conventional training (called also traditional) that comprises several training declinations, including the most ancient, the natural horsemanship (called also sympathetic training) and some more modern, as the clicker training; the round-pen training, and the strength training. These techniques and training methods have their beneficial aspects, for example some of these create a bond between the horse and the human by increasing contact-seeking between them, some increase the curiosity in the horse and some do not stress them; but unfortunately, there are also some critical aspects to consider.

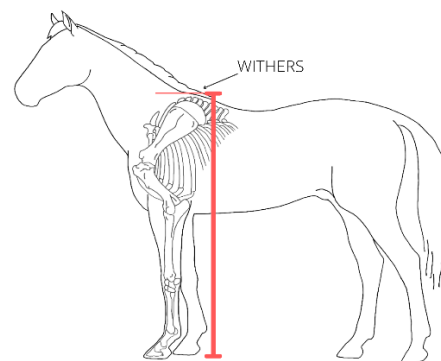
## 2. Introduction

### 2.1 Basics of horse biology: taxonomy, nutrition, reproduction, weaning, social organization and behavioral ecology

The horse (*Equus Caballus*) is a mammal of the family Equidae and classified in the order of ungulates. The domestic one (*Equus Ferus Caballus*) is a subspecies of the wild horse (*Equus Ferus*), which include a still existing wild subspecies, which is the Przewalski's horse (*Figure 1*) (Oldham, 2019). In all this large family of Equidae there are thousands of breeds, more specifically there are about 300 breeds all around the world. The most common are Arabians, Friesians, Lipizzaners, American Quarters, Thoroughbreds, American Paints, Shires, Clydesdales, Haflingers, Appaloosas, TPRs, Andalusians, Mustangs, Hanoverians and many others (Deep Hollow Ranch, 2021; Stanek, 2020; Cothran and Podhajsky, 2018). The highest breeds are Shires and Clydesdales, where stallions can reach 2 meters or a little more at the withers (Brooks et al, 2010, pp. 161). The withers (*Figure 2*) is the highest point of their back and where is measured their height, which depends on the breed and size of the horse (Rizzo, 2021).



*Figure 1: an individual of Przewalski's horse, the only existing subspecies of wild horse*



*Figure 2: the withers, the highest point of the horse's back*

The horse is herbivorous and has designated teeth to grind and ruminate grass and other types of vegetation (Cothran and Podhajsky, 2018). They require a high-fiber diet, so it is important to provide them with grass, acquired during pasture, hay, grains, mixes of concentrates (important for lactating mares, pregnant mares or working horses), mineral and salt supplements (*Figure 3*) (Blocksdorf, 2019) and some portions of fruits and vegetables.

In nature wild horses live in different types of habitats, from grasslands to deserts and mountains. They have a diet that differs according to their habitat: if they live in grasslands and mountains their

diet is mainly based of grasses, herbs, forbs (that are flowering plants) and bushes; if their habitat is the desert, their diet is composed of bushes, cacti and succulents (such as aloe). Their diet in nature can include also some root vegetables, as swedes, turnips and parsnips. Occasionally, horses can also eat some type of wild fruits. (Watson, 2023).



Figure 3: a block of salt used for mineral and salt supplements

The male horse is called a stallion: most of them have more or less 3 years before having full reproductive potential (EquiMed, 2018). Furthermore, the production of sperm is conditioned by the seasons, increasing with the lengthening of the photoperiod, reaching maximum production in May. Stallions are bigger than the females (Cothran and Podhajsky, 2018).

Female horses are called mares once they reach maturity. Depending on the breed, usually they achieve the sexual maturity at the age of 15/24 months. They are considered seasonal polyestrous, so the estrous cycle is based on the photoperiod (EquiPlanet, 2020): mares are classified as “long-day breeders”, they exhibit their estrous cycle during the months of spring, particularly mid-spring, and they finish during autumn. The gestation period is 11 months, and usually they give birth to one foal per pregnancy, twins only occasionally. The lifespan of the horse greatly varies with breed, physical welfare and husbandry and is on average 25-30, with some but rare cases of 40 years.

Feral horses and horses which are pasturing live in groups, called harems or family herds, where the male is able to control and defend the female individuals. Regarding horses, usually there is one male, the stallion, and from 2 to 4 females, the mares, with their foals at an age of maximum 2/3 years old. In one harem there can be also two stallions instead of one, but in this specific case they settle a precise hierarchy between them. When foals pass to adulthood, normally they relinquish the group, therefore young mares abandon the group to integrate in another harem at the age of about 3 years, while young males abandon their group at an age of 2/3 years old to join a specific herd called bachelor. Bachelor herds are groups composed of young male individuals, sometimes still sexually immature, which have not a family; at the age of 5 they are sexually mature, consequently they can leave their bachelor herd to find a harem where to establish: the young horse can replace a

dead stallion, he can fight with the leader stallion of a harem or he can dominate a young mare who has abandoned her original herd. Leader stallion is the one that is in charge to procure food and safety of his harem. When his group is under threat, he regroups the individuals of his harems by adopting the “driving posture”, i.e. with the head set down, the neck full stretched and the ears placed straight horizontally and backwards (*Figure 4*).



*Figure 4: leader stallion exhibiting the “driving posture” in case of threat*

Regarding the behavioral ecology, the horse is a neophobic animal, consequently it get scared easily when facing unknown and aversive stimuli, by reacting with a fight-or-flight response: it can flee or protect itself by kicking, biting or rearing (*Greene, 2019*). Instead, when it shows aggressiveness towards a conspecific or a human, it displays agonistic behaviors, similar to the fight response, so it bites or kick, but its ears are flattened backwards against the head and the eyes are rolled so that the sclera displays a little bit of white; if these signs are accompanied by a swishing tail and stomping with the feet, the horse may express irritation, discomfort or anxiety. If the horse raises its head and neck with the ears positioned forward, it is in a state of alertness, while a lower head and neck with ears in a normal position and a loose lower lip indicates a situation of relaxation (*Watson, 2022*).

## *2.2 The horse as domestic animal*

The domestic horse, as said before, descends from the wild horse (*Equus Ferus*). Before being domesticated, the horse, like many other prey animals, was hunted by humans to procure themselves food. Domestication began presumably around the end of the third millennium B.C., i.e. between the Neolithic and the Eneolithic Age. Proofs about the timing of domestication are both direct demonstrations (i.e., the art, the written texts and the funeral traces like in the graves) and indirect demonstrations (i.e., details that are derived from the population organization and geographical distribution). With the direct testimonies, it is known that in the middle of the second millennium BC, humans used horses for traction of carriages, for example in Greece. Conversely,

evidence regarding riding is not so clear, because the only proof is represented by drawings, in which it is impossible to identify horses from donkeys. In any case, our ancestors began to ride equids in general not before the end of the second millennium BC. There are also false direct demonstrations, which are for example horse-head “sceptres” (sort of relics), horse burials, cheekpieces and bits. They are called false direct demonstrations because it is not sure that they truly belonged or represented something about the horse domestication; for example, the cheekpieces were never found together with the skull of a horse, so maybe they could have used them for other purposes.

For the site of origin, the researchers confirm two places, that are Dereivka, an archeological site in Ukraine, and Botai, in Kazakhstan, in Central Asia. Ence, from that time onwards, the wild horses, in particular the foals from two months to approximately one years, began to be tamed, both to be ridden and for work, but also for reproducing them in captivity, to have meat to be consumed as food. To understand the origins of the horses it was essential to rely on the climate: in territories with cold weather, horses were relatively large, slow and docile, while in the territories with warm climates horses were leaner and smaller and more agile and speedy. Actually, the first group, the docile and slow one, comprises horses that are called cold-blooded, while the other group is composed of warm-blooded horses. It is important to specify that the warm-blooded horses are not purebred, but they are crossbreeds, so between a Thoroughbred or Arabian (hot-blooded) and a heavier horse, so with an attitude in between they are widely used for sport and riding. Thoroughbreds and Arabians are pure breeds, called hot-blooded, and are selected for their extraordinary speed and agility.

Getting on in years, from the eighth century, domesticated horses were used also in battles and wars, before firearms were developed and constructed in the tenth/eleventh century. They were also significant as means of transport by land, before the steam engine was developed in the eighteenth century (*Mills and McDonnell, 2005, pp. 5-16*). Nowadays, domestic horses are rarely used as means of transport or to work the land, but they have gained great notability in the feed industry, in sports world, for leisure time or entertainment, for police service, but also for therapy. From this modern usage of horse, it is clear that it requires training, that can be obtained through different techniques and methods.

Today worldwide it is estimated 60 million horses (*Van Niekerk, 2023*), considering that great part of feral horses is not possible to trace down, but more or less there are 600,000 wild horses, among which approximately 80,000 only in the United States. Talking about their consistency, the United States has the major concernment, counting over 7,2 million of horses. Within US, Texas has the

highest population, having about 767,100 horses. While in the European Union, Romania counts the highest population, roughly 447,000 individuals (*Fraser, 2022*).

### 3. Learning theory

Learning is defined as relatively stable and adaptive alterations of individual behavior because of experience it acquires. It is defined as *stable* because the behavior that is learned must be stable in time. At the same time, it is *relatively* stable because even if an animal has learned something, right after, if the circumstances are changed, maybe it cannot exhibit the same behavior or response, because “the same response is not always appropriate to the same stimuli and knowing what behavior is appropriate may depend on keeping tracks of past events” (*Mackintosh, 1999*). It must be of the *individual*, because otherwise it is not a learned behavior, but is based on genetic predisposition. Finally *adaptive* alteration means that the animal is able to cope with the environmental conditions and changes, being proficient of interacting and coexisting with every situation (*Mackintosh, 1999*); the opposite of adaptive behaviors are the stereotypic behaviors, that I described in chapter 2.3.

Learning is a process that occurs spontaneously in nature, but since the beginning of domestication, it is also handled for exercises, behavioral tests and management techniques, for example in zoos, rehabilitating rescue centers or aquaria: on this wise, the animal is less stressed and maybe less or not at all restrained.

The most basic and common forms of learning are classically divided into two: non-associative and associative learning.

Non-associative learning is characterized by a simpler process than the associative learning, and it is called non-associative because the animal is not learning an association between two events or items that are associated to each other. They are learning only about one single event, stimulus or object. In this group there are two types of processes, and they are habituation and sensitization. Habituation is interpreted as the process with a progressive decrease of the strength and frequency of a response to repeated stimuli, that are irrelevant for the animal, therefore it understands that the stimulus is harmless, and it ignores it. This is one of the most essential processes because it is thanks to this that the animals adapt to their environment, and so it is at the base of all the other learning processes. Examples of habituation in the equitation world are physical and dynamics aspects such as saddlery and harnesses and the continuous weight of the rider above them (*McLean*



and Christensen, 2017, pp. 20). To occur, habituation has to have crucial aspects: the stimulus has to be presented at a sufficient low level of intensity, otherwise the opposite would be induced, that is sensitization; for instance, if a young horse has to be trained, you cannot start by putting all the harnesses and saddlery on it, because it will get scared and it will enter a negative emotional state, but you have to begin with a lower intensity. It means firstly by putting a blanket on its back and habituating it, then you can add a heavier blanket, then the saddle pad and so on. So, the increments in the extent of the stimulus can be executed when it is observed in a stable and reliable way the absence of reaction to a certain level of exposure. Another aspect about habituation is that it is context-specific and stimulus-specific: it conveys that if an animal is habituated to a specific sound in a specific place, it does not imply that it is habituated to all the sounds and in all places. Therefore, an important aspect of inurement is the generalization, i.e. to generalize the absence of response to stimuli/situations similar to the one in which it had occurred.

The other process is sensitization, that I mentioned before. Sensitization is the opposite of habituation, so the response amplitude is increased (*McLean and Christensen, 2017, pp. 20*). More precisely, an animal learns to enhance the strength and frequency of a response following a positive or a negative emotional experience: as example, in the period that follows a negative experience, the animal is in a negative emotional state, and if we present an object or a person to it at this point, it will overreact to this, even if it is an harmless stimulus. The same can happen during horse training, for instance when a dog, any another animal or a human suddenly shows up from a corner and the horse immediately swerves (i.e. it changes suddenly and sharply direction) because it gets scared: from now on the horse can learn to swerve every time in similar situations (*McLean and Christensen, 2017*).

While habituation is the process of response reduction to an irrelevant stimulus, desensitization techniques are methods that are applied for reaching habituation. This because horses are neophobic. There are 4 desensitization methods: systematic desensitization, counter-conditioning, overshadowing and response prevention.

Systematic desensitization is used for an attenuation of behavioral problems induced by an inappropriate stimulation, hence it is a progressive habituation to an arousing stimulus. Examples can be seen during training of police horses, where they are desensitized to smoke, noises or arrays of people (*McLean and Christensen, 2017, pp. 20-21*).

Counter-conditioning is usually used together with systematic desensitization: it is based on training the animal to exhibit a behavior that is “counter”, i.e. opposite, to the one the trainer wants to remove. The preferred behavior is rewarded, so the animal learns that it has to execute the new behavior when it is facing the aversive stimulus, and that the aversive stimulus predicts a positive

episode (*McLean and Christensen, 2017, pp. 21*).

Overshadowing is defined as the habituation to the least relevant stimulus when two or more stimuli are presented simultaneously. As an example, the procedures with a needle. When the horse sees the syringe, it has flight responses because it can be afraid of it: the solution is to train the horse to step back and forward with rein command, so as soon as the horse has a flight response by seeing the needle, the person with the syringe stops and then the horse received a light command with the reins to make a step back and maybe one forward, increasing every time the pressure on the reins; so, the reins overshadow the reaction to the syringe; the syringe is put every time closer to the horse and in the moment it shows the minimum sign of fear, the process to make a step backwards and one forward is repeated, until its response to the syringe has completely diminished (*McLean and Christensen, 2017, pp. 21, 22*).

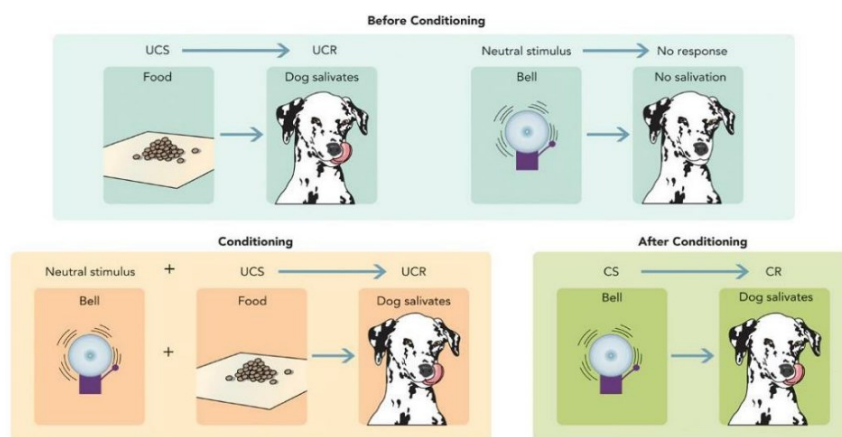
The last is response prevention, disparate to all the other 3 methods because this does not imply a gradual habituation: it is about the restraint of the animal in order that it stays in the place or situation that it is afraid of. Not always this is the most suitable method, because the animal can enter in learned helplessness: it means it will be apathetic and in a fictitious situation of tolerance where it does not even try to get out of this situation, threatening severely its welfare (*McLean and Christensen, 2017, pp. 21*).

Concerning associative learning, the animals learn about two elements being in sequence, it means they can predict what comes next. In nature this is very advantageous and helpful because, as an example, a sound emitted by an animal preannounces the presence of a threat, like a predator or any other items. There are two main types of associative learning: classical conditioning, called also Pavlovian, and operant conditioning.

Classical conditioning was first described in the 19<sup>th</sup> century by Ivan Pavlov, a Russian physiologist, from here the name *Pavlovian* conditioning. He studied the dogs, in particular the saliva production, and he noticed that salivation could occur also before the food was presented. The process of classical conditioning starts from a stimulus called unconditioned stimulus (UCS), in this experiment is the food, that is able in turn to induce a response called unconditioned response (UCR), that in the case of Pavlov food produces a salivation response in the dog. To acquire this association, the animal requires a definite number of trials with this type of association (*Akpan and Kennedy, 2020*).

Pavlov observed that if the UCS, the food, was preceded by a neutral stimulus (NS), for example the sound of a bell (*Akpan and Kennedy, 2020, pp. 72*), and this last was presented to the dog for a

certain amount of time, this NS becomes a conditioned stimulus (CS). The stimulus is called conditioned because now is able to induce a response, that in this case is the production of saliva, so this UCR is now called conditioned response (CR); *Figure 5* resumes all this with a simple scheme. There are several aspects to consider if we want the conditioned response to occur: first of all, the CS (the bell) is shorter, less intense and less stable, consequently it doesn't completely replace the UCS. In this regard, the sequence of presentation and the time interval between the CS and UCS is essential and is the base of the principle of contiguity. If the presentation of the CS ends just before the UCS starts, it is the best way to induce association because the 2 stimuli are very closed, with no possibility that something happens between them; if the CS lasts a little more while the UCS is already started, the association is still quite strong; if there is some period of time between the end of CS and beginning of UCS, the intensity of the association will decrease depending on the amount of time that passes, until there is no more association; finally if the CS is presented at the same time of the UCS or after the UCS, the association no longer takes place. Additionally, classical conditioning is divided in excitatory and inhibitory conditioning: excitatory means that the CS is associated with the appearance of UCS, while inhibitory means that the CS is associated with disappearance of UCS.



*Figure 5: Classical conditioning scheme: before conditioning, conditioning, after conditioning; at the end the CS (bell) induces a CR (salivation)*

Two procedures are very meaningful in classical conditioning, that are extinction and disinhibition. Extinction is the procedure based on the fact that if for several times, we do not present to the animal the UCS (the food) after the NS (the bell), the association will be extinguished. To understand the rate of extinction, it depends on how strong the association is, because it gets stronger the more it happens. Disinhibition, instead, is based always on the CS presented alone for

several times, but the CR can suddenly re-emerge after we present another stimulus to the animal. This usually happens during the period of extinction. Furthermore, Pavlov found out that extinction does not last permanently, but there can be a spontaneous recovery, it means that the response can reappear if we present the CS alone (*Akpan and Kennedy, 2020, pp. 74*).

In addition to contiguity, extinction, spontaneous recovery and disinhibition, in classical conditioning there are also other principles, for example the principle of contingency and the principle of generalization and discrimination, that in conclusion are the same principles of operant conditioning. Contingency is the concept that claims that if there is the following or not following of the UCS after the CS has occurred, it means that the CS predicts always the outcome, therefore it is a positive or negative contingency, respectively; instead if by presenting the CS, the UCS happens only half of the time and the other half there is another outcome, the association will not be learned and there will be no contingency. For the principle of generalization and discrimination, however, the CS is still fundamental: we have a generalized response, called also stimulus generalization, when there is an original CS, for example the sound of a metal door bell, and then by presenting other similar sounds, such as a glass bell, a lower pitch bell, the melody of a mobile phone etc., these are able to induce the same response; stimulus discrimination, on the contrary, happens when only that specific type of CS (metal door bell) induces the response.

Operant conditioning, also known as instrumental conditioning, is a method of learning practiced with animals which involves the use of rewards and punishments, but also in our everyday life. All this can be referred as the Law of Effect, a theory proposed by Edward Thorndike, where in specific conditions, among all behaviors, the one that will be accomplished with more frequency is the one that gives the most positive consequence, while the behaviors followed with a negative outcome will become less and less frequent: there is an association between a behavior and a consequence (*Cherry, 2023*). An example can be the one with the rats, where a rat is in a cage and there is a light: when the light is green and it presses the lever, it receives food pellet as a reward, while if it presses the lever when the light is red, it does not receive the reward, but a mild electric shock; in this way they learn to press the lever only when the light is green. Therefore, operant conditioning relies on the principle that behaviors followed by a reinforcement will be intensified and consequently more potentially to occur, and behaviors followed by a punishment will be depressed and less occurrent in the future (*Cherry, 2023*).

It is assumed that reinforcement and punishment are essential in operant conditioning. There are two types of reinforcements that we can categorize: positive reinforcements, where you provide a pleasant stimulus after the behavior has been presented, and negative reinforcements, where you remove an unpleasant stimulus when the behavior has been done correctly. It is important to precise

that the adjectives positive and negative do not refer to the emotional state of the animal, but to the addition or the removal of the stimulus, respectively. Reinforcements can be also primary or secondary: primary if they are the basic biological needs of animals such as food, water, sexual and social partners, and warmth, and secondary usually are used in association with the primary ones, for example verbal appreciation and petting. As for reinforcement, the same is valid for punishment, it means there are positive punishments, where you present an unpleasant stimulus after an unwanted behavior, to reduce the frequency of that, and negative punishments, where after the unwanted behavior you remove a pleasant stimulus (*Akpan and Kennedy, 2020, pp. 80*). Punishment generates effective results only if it occurs as soon as possible after the behavior: if your dog broke a vase two hours before you came back home, there is no sense to punish it because it will be not able to understand the association. Then punishment needs to be dosed correctly, i.e. not too much or too little, and it has to be given with full consistency (100%) every time the behavior appears: if you punish your dog that asks for food at table only when you have guests at home, but not when you are alone, the dog will not learn the association.

Sometimes punishment can elicit a few side effects: it can induce learned helplessness, such as in response prevention method in non-associative learning, therefore the animal becomes apathetic for fear of being punished. But it can also lead to a reduction in attention with a consequent unwanted aspect in the human-animal relationship, i.e. it leads to frightened and/or aggressive reactions. Furthermore, the principles of contiguity, contingency, extinction, spontaneous recovery and generalization and discrimination of classical conditioning are equally valid for operant conditioning.

## **4. Training methods**

### *4.1 Different techniques and methods*

As described in the previous chapter, there are different learning techniques which can be applied in general to all animal trainings, also including horse training. Several training methods exist, representing the way the theory is applied, and they use these techniques: positive and negative reinforcement, positive and negative punishment, habituation and lunging. The training methods are: conventional training (that comprises some declinations, as the natural horsemanship and the clicker training), and round pen training.

Starting with the techniques, there is the positive and negative reinforcement. Positive reinforcement is the addition of a pleasant stimulus after the desired behavior is presented, while

negative reinforcement is the removal of an unpleasant stimulus to obtain the willing behavior (*Murphy and Arkins 2007, pp. 10*).

Regarding positive reinforcement, it has never been used so widely, due to ancient anthropomorphic beliefs. There are also some unfounded evidences: horse riders or owners are used to praise their horse by saying “Good boy!” or slapping the horse neck, thinking that these are the right reinforcers or rewards, but for correctly applying these, it is essential to associate them with primary positive reinforcers, like food. Furthermore, instead of patting the horse neck, it is demonstrated that scratching the wither is considered more gratifying. Only in the last few decades the use of positive reinforcement has slightly grown, specifically with the use of secondary reinforcers with the clicker training, that I will explain later (*McLean and Christensen, 2017, pp. 23*). Positive reinforcement can be used regularly in conjunction with negative reinforcement, such as training the horse with positive reinforcement for 5 minutes per session and 4 times per week besides their usual training with negative reinforcement and having food as positive and pleasant stimulus (for example a carrot or a snack) (*Larssen and Roth, 2022*).

There can be different training programs for positive reinforcement, but trainers can use the program about a step-by-step foundation behaviors: in a total number of weeks they train their horses to stand still, to touch a specific target with their muzzle, to touch different targets in different environments, to follow a target, to follow a target in a trail with cones and poles, to go to a static target, and to use one of their front legs to touch a target in front of them. Obviously, the trainer uses food as positive reinforcer (*Larssen and Roth, 2022, pp. 2, 7*).

Talking about negative reinforcement method, this is the most used in horse trainings and, as said before, it involves the subtraction of an unpleasant stimulus when the horse performs the right behavior. Usually, negative reinforcement trainings are very used to rear horses under saddle (*Henderson, 2015*), especially young horses that have at least 2 years of age. In horse world, negative reinforcement is implicitly used every time there is the employment of tactile instruments such as legs, reins, whips or spurs by the rider, trainer or handler. For example, a rider applies reins tension until the horse halts, then when the horse halts, it is rewarded with the subtraction of the aversive stimulus (reins tension) (*McLean and Christensen, 2017, table 2 pp. 23*); or when the rider applies pressure in the horse’s flanks, then the horse starts to move forward and so consequently we alleviate the pressure of the legs.

Another form of pressure that can be used for negative reinforcement training is “work”: when the horse is used to buck, the rider does not have to stop or slow down the horse, but he/she has to put it at work, it means he has to put it in a harder and faster trot or canter for more or less one minute; then, when the horse starts to not buck anymore, the rider can make it walk with soft reins; next, the

rider can proceed with his training and every time the horse starts to buck, the rider has to put it again into harder and faster work, so the horse is taught that it has to stop bucking if it does not want to have harder pressure (*Jones, 2017*).

Besides positive/negative reinforcement, there are also positive and negative punishment. Positive punishment is the addition of an aversive stimulus, while negative punishment is the subtraction of a pleasant stimulus, and in general it serves to suppress an unwanted specific behavior (*McGreevy and McLean, 2010, pp. 193*).

Positive punishment is more exploited than the negative one and some examples are:

slapping/smacking for bucking behaviors, hard application of the whip, heavily pulling the reins, punching in the nose for biting behaviors, tying firmly the head of the horse (with bit and reins), rapping (which is the technique that consists in hitting the legs of the horse when it touches the rails or the jumping obstacle) and kicking, all these being the most discomforting and a threat for the welfare of the horse (*McGreevy and McLean, 2010*). Of course, there are less painful and discomforting techniques, as a light pressure of the whip or of the spurs, and also in the husbandry management, as the use of the electric fence, modulated with an adequate current intensity.

Even if seldom used, negative punishment techniques are for example leaving the horse tied to a pole for certain periods of time, subtracting food and social isolation. All punishment in general is related also with the emotional sphere of the horse, besides the physical welfare, because it induces fear and displeasure and consequently it decreases the learning ability of the horse (*McGreevy and McLean, 2010*).

If punishment (both positive and negative) is non-contingent, it is inefficient and meaningless, and this is a case in jumping training: when the horse refuses to jump and it stops suddenly, lots of riders are used to punish this behavior with the use of the whip, sometimes also too severely. But doing so, they do not understand that this is futile, because they are teaching the horse to having a flight response in front of an obstacle, due to the elevated anxiety and fear they have imposed on it, making the horse to jump the obstacle only for this reason. Consequently, this is considered a very low efficient training. A better approach can be to apply punishment as soon as the horse start to slow its pace or to discard, but not after that it stops (*McGreevy and McLean, 2010, pp. 193-197*).

Next technique is habituation: considering that habituation is the reduction of the behavioral response of the animal to an irrelevant stimulus, this is very significant in the horse world, especially in training, being aware that horses are very susceptible and neophobic animals. This leads horse riding to be one of the most dangerous sports, both for the rider and for the horse itself, having lots of grave episodes. Consequently, it is essential to minimize as much as possible this risk

of accidents, by habituating the horse to apparent frightening stimuli or events and lessen its fear with 3 types of techniques: habituation, desensitization and counter-conditioning. Habituation provides for the exposure of the full stimulus, desensitization provides for a progressive exposure of the stimulus without causing the unwanted reaction, and counter-conditioning by stimulating the horse to engage in a contrasting behavior contradictory with the unwanted reaction (*Christensen et al., 2010*).

In addition to desensitization, there are other two techniques that can be applied for the most scared horses, and they are the approach conditioning and the stimulus blending. Approach conditioning takes advantage of the natural instinct of the horse to discover and being curious about new objects, so the rider encourages the horse to come close to the frightening stimulus, and this behavior is negatively reinforced: it means the stimulus (for example a tractor or a motorbike) is retired. Later, the rider stops the horse before it reaches the stimulus, and that is retired again; then the rider makes it proceed, and when the horse slows down, it is intentionally stopped and is repeated until the horse is as close as possible. This technique, as well, is very used during trainings of police horses.

Stimulus blending is based on desensitizing the horse with a stimulus similar to the original frightening one: the frightening stimulus is applied at the same time and gradually with the similar stimulus and with a low intensity, and then with a progressive increase. As example, if the horse is scared of spray but not of water tube, you mix gradually the spray with the tube, by disguising the aversive stimulus (*McLean and Christensen, 2017, pp. 21*).

Last technique used for training horses is lunging. Lunging (*Figures 6, 7*) is a technique that involves the use of a lunge, important to balance and coordinate the horse in walk, trot and canter, moving it in a large circle. For a correct use of this technique, further essential equipment other than the lunge are the lunge whip, lunge cavesson, lunge roller and running side reins. It is essential to apply this technique several times before the horse is ridden, especially if it has a restless and uneasy temper (*Klimke, 2019*).



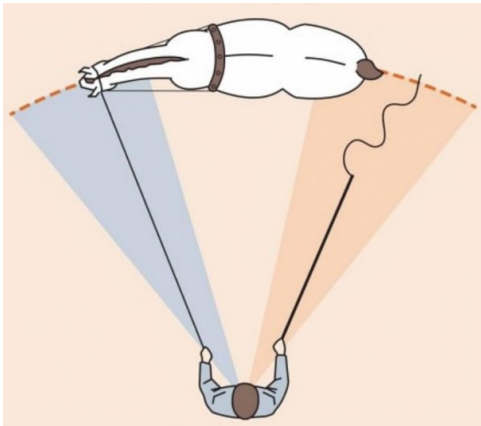


Figure 6: application of lunging technique



Figure 7: lunging technique, with some of the essential equipment (lunge, lunge cavesson, lunge roller and running side reins)

For the training methods, instead, it has been said that there are the conventional trainings (with inside the natural horsemanship and the clicker training), and the round pen. Starting with the conventional training (*DeAraugo et al., 2014, pp. 237*), it is called also traditional training. This training method comprises several training declinations, including the most ancient, the natural horsemanship (called also sympathetic training); there are also more modern declinations, as clicker training, that I will explain later on. The traditional approach is set up on the control and dominance, established by the owner, trainer or rider, occasionally using punishment or negative reinforcement to adjust or advance the behavior. Since it is based on dominance, the trainer is the leader that predominates, while the horse has to obey: a discipline as example is classical dressage where the horse has to be very obedient, agile and flexible (*Miles, 2023*).

- The natural horsemanship declination, instead, is based on the relationship between the horse and the human, thus this is not built on the forced obedience by the horse, but on the reciprocal approach with the final objective of working with the natural behaviors of the horse (*Miles, 2023*). It is for this that it is called also *sympathetic* training method, because the human expresses its sympathy, comprehension, towards the horse. Additionally, the natural horsemanship training method is a sort of freestyle method.
- Another declination of the conventional training, as said before, is the clicker training, an innovative method introduced at the end of the 20<sup>th</sup> century. It provides for the use of a clicker (a handheld device) which makes a “clic” sound, and this anticipates the positive reinforcer, usually a small food reward. Thus, the sound of the clicker becomes a secondary reinforcer (*McLean and Christensen, 2017, pp. 23*). Clicker trainings are initially used to

teach a horse to not react aggressively or with undesired behaviors (called “mugging” behaviors) when they see food or treats from the owner’s hand: they understand that the clicker foresees a positive stimulus (food reward) and that only a calm behavior with good distances from the owner, and not the aggressive behavior, predicts the treats. It can be applied every time we want to see more frequently any behaviors. As example, an anxious or a reactive horse: instead of using tranquilizer drugs, we can teach and reward it when it walks or trots calmly (*Henderson, 2014*).

The other type of training method is the so-called “round-pen” training (*Figure 8*) that provides for the training of the horse in a round enclosed pen and without the use of equipment and harnesses, but in freedom. The usage of circular and enclosed spaces for horses was introduced with the Roman Empire, but it became very popular and used by horse trainers and owners only 40 years ago. In round-pen trainings, the relationship human-horse is of great importance, because the human has to impose him/herself as a conspecific of the horse, more specifically as the dominant conspecific, and the horse has to respond as if it reacts to another horse, following their ethological nature. Thus, the trainer has to simulate both the behavioral and postural properties of the leader. As for the most of horse trainings, also in round-pen trainings the results are achieved by applying the theory and practice of habituation, classical and operant conditioning (*Henshall and McGreevy, 2014*).

There are different round-pen training declinations, but one of the most used and under examination is the one called “chase-away”, a method of Monty Roberts (*Roberts, 1998*), that can be applied both with never-handled horses and horses that had too much and too hard training. The horse is released in the round pen, and it is chased also up to 15 minutes by the trainer with aversive behavioral and auditory stimuli, for example direct gaze, sudden movements, arm movements, drop a rope on the horse and strong vocal sounds, so the horse reacts with flight responses. The trainer behaves like he/she is showing aggressive agonistic behavior, and he/she can also move towards the direction of the horse, making it to suddenly change direction. After some period of time, these stimuli are lowered of intensity, so the horse can behave more calmly, approach the trainer and licking and/or chewing. Licking and chewing are seen as signals of respect towards the trainer and to return to herd’s safety. But these signs of non-ingestive oral movements are under investigation, because they may also signify the stress level of the horse or may be a normal physiological response, so an ingestive behavior only to show the status of the horse as a non-dangerous herbivore. From here, the trainer acquires “rounded postures” (*Henshall and McGreevy, 2014, pp. 3*) and lowers his/her movements; then the trainer can try to make the horse to approach him/her by moving away from the horse and observing if it follows him/her. If the horse does not do this, the

trainer chases it again, and this is repeated until the horse remains with the trainer. If there is a great distance between the horse and the trainer, it means that the horse did not accept the trainer. All the round-pen trainings are based on a movement response of the horse away from the trainer, the only thing in which they differ is the way and type of postural and auditory signals the trainers use.

It is notable to consider that round pen trainings are used not only for young and/or undomesticated horses, but also for horses already domesticated, to make them exercise and move by walking, trotting or cantering, usually tied and held with a rope and the use of a lunge whip, as in lunging trainings.

In conclusion, round-pen trainings are founded on the relationship human-horse, based on mutual benefit, respect and also companionship (*Henshall and McGreevy, 2014, pp. 1-8*).



*Figure 8: horse trained with the round-pen training*

#### *4.2 Benefits and critical aspects of different techniques and methods of training*

We have seen that in the equitation world, there are many various training techniques that are used by different training methods. Furthermore, almost all these techniques and training methods have their benefits but there can also be some relevant negative and critical aspects to consider, for preserving the welfare both of the horse and of the rider or trainer. In this chapter, positive and negative aspects of different training methods will be considered.

Starting with the benefits of the techniques, regarding the relationship between horse and human, the study of *Larssen and Roth, 2022* is of great importance, where they try to add some positive reinforcement to the regular trainings with negative reinforcement. They found out that the horses that were trained with positive reinforcement in addition to their usual training were less stressed, in the means that they did not show so many stress-related behaviors; they had less avoidance and agonistic-aggressive behaviors; and they were more brilliant in terms of learning a task, i.e. they learn faster and remember better the tasks. But, for having data and results about the emotional state

of the animal and the long-term stress level, there would be the need of a very long study, of at least one year (*Larssen and Roth, 2022*). Furthermore, in the relational sphere horse-human, it is demonstrated that positive reinforcement improves this connection between horse and human: these horses have a more positive approach towards their trainer/owner and they have an increased behavior of contact-seeking and curiosity towards both the trainer and an unknown person (*Larssen and Roth, 2022, p. 1, 5*). Positive reinforcement is essential also because it keeps the horse's mind active, i.e. it enhances its mental stimulation, besides the physical one, by increasing its quality of life and longevity. Always in the context of positive reinforcement, there are some centers all around the world that host rescued horses, and usually these horses are subjected to a specific rehabilitation and training program to enhance their physical but also psychological aspect: the aim is trying to rehome these horses in the best possible ways. The rehabilitated horses that are trained with positive reinforcement, in contrast with the negative one, show a higher motivation during the training sessions and exercises, by having at the same time a more exploratory behavior and a higher problem-solving capacity in new environments. Furthermore, also the rehabilitated horses, with the use of positive reinforcement, show more contact behaviors with humans. Positive reinforcement is the most advisable technique for rescued and rehabilitated horses, because it does not compromise their welfare, being that most of these horses have suffered from chronic stress in their past background (*Innes and McBride, 2008, pp. 357, 358, 366, 367*).

With regards to habituation techniques, the study of *Christensen et al., 2010* was conducted for assessing the best way to habituate a horse. The test stimulus in all 3 methods was a white nylon sac and it was applied with a string at a speed of 1 m/s, 5 meters from the food container where each horse was eating in the middle of the testing arena. For habituation method, the white sac was fully exposed once every training session until they have no or minor behavioral reaction (head up position) and they continue to eat. For desensitization method, the white sac is presented gradually to the horse, and once habituated, it was fully exposed to the stimulus. Finally, for counter-conditioning method, the horses were trained to do an association between the white sac and a positive reward, so by removing the food container and substitute it with a white bag similar to the stimulus with some feed inside and with the white nylon sac folded near this white bag container; the following step is with the white nylon sac fully exposed while the horse is eating, and finally the white bag is replaced with the original food container and next to it there is the full exposure of the stimulus while the horse is eating. This type of method, counter-conditioning by eating from a frightening stimulus, is usually pursued in trainings of police horses (*Christensen et al., 2010*). During the first training session, the horses in the group of counter-conditioning had a rise in the heart rate response, because they had suddenly to eat from the white bag, while the horses from

habituation and desensitization had the same heart rate level and behavioral response, and an answer to this can be that horses are prey animals, so they react to any unknown stimulus, independently of the intensity with which it is presented (full stimulus or progressive stimulus). Then, at the end of the sessions, so in the final step with the presentation of the full stimulus, the horses from the group of habituation method, reacted differently than the others: they were more reactive at the presentation of the stimulus, they had a higher heart rate response, and they took longer to return to the food container to eat. Furthermore, there is a correlation between the heart rate and the number of training sessions, because the horses with a higher heart rate response, hence with a very reactive response, required more sessions to habituate and to calm down in front of the stimulus.

Thanks to this study, it was clear that in relation to the quickness of the training to act calmly to an apparent frightening stimulus, the desensitization method was the best one, because it required less training sessions, in contrast to the counter-conditioning method that needed the highest number of sessions. This study can be used also in all trainings in general: some parameters, for example the reactivity and instant response of the horse to a frightening stimulus or event, can foresee its temperament, rideability and trainability. Consequently, for the most reactive horses and to reduce at best the scared reactions in front of a stimulus, it is necessary a softer training, so the most effective is the desensitization method, in comparison with habituation and counter-conditioning, that can cause the horses to become sensitized (*Christensen et al., 2010, pp. 439-443*), or worse to enter in a learned helplessness (*McLean and Christensen, 2017, pp. 21*).

Another benefit for desensitization method, but also for the counter-conditioning one, is that horses become able to generalize about the stimulus and have less reactivity behaviors at the end of the training sessions (*Christensen et al., 2010, pp. 442, 443*).

Instead, we have seen that lunging technique is important to train very young horses or non-domesticated horses, but beside this, it has also some benefits for the physical aspect of the horses: it corrects back and neck problems of the horses. It can also be very helpful in that days of the week when the horse is not ridden, so the horse can be exercised with the lunge 15/20 minutes, important to relax it mentally, too. When the trainer/rider is lunging the horse, he/she can also inspect the muscles of the horse, to see if they work properly, and monitor the horse's reactions. Another benefit for lunging technique is that at early stage it makes the horse disposed for backing and mounting, because the horse learns the controlling aids and the guidance to go forward and backward thanks to the use of voice, lunge whip and reins. The last positive aspect of lunging training is that the horse learns to work in balance, because it must work in circle by walking, trotting, and cantering (*Klimke, 2019*).

Passing instead to the training methods, it is essential to refer to the study conducted by *Visser, Kathalijne, et al., 2009*. 28 young horses were trained to do an easy initial dressage test, half with the conventional method and half with the sympathetic declination. With the conventional training method, horses were trained in 5 weeks by equestrian students and their trainer, with the lunging, acclimatization to bridle with lunging, acclimatization with saddle and lunging, ridden work with long reins and lunging, and then without lunging (*Visser, Kathalijne, et al., 2009, pp. 49*). Instead, the group of horses within the sympathetic training were trained by freestyle trainers with different techniques, such as ground work, learning to avoid pressure, working on long-lining (long-reining) and habituation and familiarization to frightening stimuli, events and humans. During these training sessions, initially riders leaned on the back of the horse without saddle, then they sat; after this, they put the bareback pad, the bridle and then the horse was lunging; at the end the trainers interchanged the groundwork with the free riding (*Visser, Kathalijne, et al., 2009, pp. 49*). Free riding means to ride the horse without both the saddle and the bridle, but only with a neck rope around the neck of the horse. At the end of the experiment, it was concluded that in the sessions of lunging with the saddle and during trotting with the rider, the horses trained with sympathetic declination were more relaxed, less tensed and stressed (indicated by the high heart-rate variability value), with a low heart rate and with a comfortable head position with no or few lips movement and teeth grinding, in contrast to the horses trained with the conventional method. The group of the conventional method in general had an accentuated activity and reactivity, and they exhibited more conflict and scared behaviors. In means of technical fulfilment, both groups achieved the same level, but at the end, for the correct welfare of the horse, it was deduced that the sympathetic training was the best one, because horses had a lower level of stress during the training sessions (*Visser, Kathalijne, et al., 2009, pp. 48-52*).

Clicker training among the conventional training method, too, has some benefits and one of these is the same as almost all the others: it reinforces the relational sphere between the horse and the trainer/owner and makes the horse conceiving that interacting with a human has not to be stressful. In addition, this type, as all the other that provides for a reward, increases the physical and mental stimulation of the horse, and enhances it to involve in the exercises (*Michele, 2023*).

Talking about the round-pen trainings, also these have some beneficial aspects. Some studies demonstrated that the horses that are trained with round-pen trainings show a lower cardiac and behavioral activity. Additionally, like the positive reinforcement and the sympathetic trainings, also round-pen trainings enhance the relationship between the horse and the human (*Henshall and McGreevy, 2014, pp. 4*). For young horses, round-pen trainings are essential for developing balance

and rhythm, before trained to be ridden. Being a limited enclosed fence, it can be considered a safe place, both for the young horse that has to be handled and for a new rider that has to ride the horse for the first time, because the horse cannot run away. Round-pen trainings are beneficial also because when the trainer/owner let the horse to move freely without any restraint or lunge, he/she can observe, control and inspect if it has some lameness or other physical problems and he/she can evaluate the attitude of a new or young horse, by observing its behaviors (*Fought, 2020*).

These were all the benefits of the different techniques and methods, but unfortunately in equitation world there also many critical and negative aspects to take in consideration. Starting from the fact that the horses, to be trained and/or handled, are kept in stables for all their life, not always the prerequisites for their husbandry, management and welfare are respected. Some wrong management routines can induce them to develop the so-called stereotypic behaviors: for example, if they do not get the right and balanced diet, if they are always isolated in their box without possibility of contact with their conspecifics, if they are trained too much or if they do not have the possibility to move or exercise outside. Therefore, before looking directly at the training methods, it is essential to have a right healthcare of the husbandry management and welfare of the horses.

Starting with the techniques, there is the positive reinforcement: food reward is not always considered a good tool, because an association can be formed, between the delivery of the food reward and the subsequent behavior of the horse, for example stereotypic behaviors as crib-biting and waving (*Miles, 2023*). Besides stereotypic behaviors, horses can also develop some sort of dissatisfaction; consequently, this is bad for the wellbeing of the horses themselves, but dissatisfaction can intensify until it turns into aggressive behavior, being dangerous for humans. Another critical aspect that positive reinforcement can provoke is the so-called “sign tracking”: the horse is obsessed with the food reward, and for this reason it tries to interact with exaggerate frequency with the signal that precedes the food reward. In addition to sign tracking there is also a behavior called mugging, with which the horse annoys the trainer/handler until he/she gives it the reward. Then, positive reinforcement, (as also clicker training that provides for a reward), may be considered “slow”, i.e. it may require lots of time for the horse to learn the exercise, so the results are not as quick as the conventional methods (*Miles, 2023*).

With the negative reinforcement, instead, the riders not always understand the negative reinforcement of pressure reduction, because sometimes they reinforce involuntarily a wrong behavior of the horse: for example, when the horse rears or flees, the rider accidentally reduces the pressure of the reins or legs. Another problem is the subtraction of the pressure cues out of time, by strengthening consequently an incorrect response or a derived conflict or stress behavior; for

example, when the rider does not release the pressure of the reins when the horse performs the desired behavior (*McLean and Christensen, 2017, pp. 25*). In the field of rehabilitation and rescue centers/stables, rescued horses undergo some rehabilitation program and training, but negative reinforcement method is not suitable for them, because it increases the level of acute stress, given the fact that these horses have already suffered from chronic stress or human mistreatment in their past. By using this technique with this type of horses it may compromise their welfare (*Innes and McBride, 2008, pp. 358, 367*).

Talking about negative punishment, fortunately it is not so widely used in horse training, but sometimes it occurs involuntarily (*McGreevy and McLean, 2009, pp. 194*). An example is water deprivation: some riders, owners or trainers deprive their horses of water, because with dehydration they show less flight behaviors. Water deprivation can also be used by some trainers/owners when horses oppose themselves to be conducted in the trailers. This technique of water deprivation, but in the same way also food deprivation, is considered critical, unethical, and unhealthy for the welfare of the horse; in particular, deficiency in water can lead to serious and incurable renal damages (*McGreevy and McLean, 2010, pp. 192, 193*).

Besides negative punishment there is also positive punishment, that can cause learned helplessness: horses are continuously exposed to painful or discomforting stimuli at the point that firstly they experience the so-called experimental neurosis, an abnormal behavioral and psychological condition that can provoke aggression, irritability, avoidance and escape behaviors; when these punishment stimuli become inevitable, it is in this point that the horse enter in a state of learned helplessness (*McGreevy and McLean, 2010, pp. 194, 195*). As example, the whip and the spurs, used by the rider if the horse does not go forward or lacks the motivation to do what the rider asks to it, so these are used as a positive punishment. If these are used too often or too strongly, they stress and can cause pain to the horse (*McGreevy and McLean, 2010, pp. 188-194*).

Punishment in general has some critical aspects to discuss about. First of all, it can provoke emotional changes in the horse, therefore this impairs its learning abilities and the attention, and if the horse does not understand how to prevent and escape punishment, it can experience some sort of anxiety and exasperation. Consequently, it may respond with problematic behaviors or enter in a state of learned helplessness (*Hockenhill and Creighton, 2013, pp. 246*). Then, punishment is non-directive, in the means that it suppresses the unwanted behavior but does not promote an alternative behavior. It can also get to the point of desensitizing the horse to the punishment stimulus if the intensity of the punishment is unbalanced. Last, punishment can be critical also for the person who



train or handle the horse, because the horse can associate the punishment with the person who delivers it.

In relation to habituation techniques, counter-conditioning is not very beneficial: in respect to habituation and desensitization, this is the one that requires a higher number of training sessions for the horse to habituate to a stimulus or an object. Furthermore, in general the techniques of counter-conditioning and habituation may be critical for the horses, since they can become sensitized to a stimulus, object or situation, because they can predict what will happen; at worse, also these ones can provoke learned helplessness (*Christensen et al., 2010, pp. 442-443*).

Passing to the critical aspects of the training methods, there is the conventional training method. It has been seen with the study by *Visser, Kathalijne, et al., 2009* that the horses trained with the conventional training, in respect to the natural horsemanship, have a high level of reactivity and stress during the training session; they have a high heart rate; they exhibit more conflict and scared behaviors and their body is more tensed.

- Then we have seen the clicker training, a declination of the conventional training method. It has some critical aspects, too: it is important to consider that the use of food reward can have some limitations because it can provoke undesired behaviors in the horse, for example aggressive behaviors, biting, rudeness, and greediness. Next, during training, the horse can revolt if it correctly performs an exercise, and it is not rewarded by the trainer/rider. Last, clicker training is not so practical during riding, because the rider has to keep in its hand the clicker device and with a fast gait like trot or canter, it becomes more difficult to click it; consequently there is the risk that he/she loses control of the reins or does not control in an appropriate way the horse, and it could be dangerous (*Michele, 2023*).
- We have seen that classical dressage is one of the disciplines that adopts the conventional method and has some negative aspects. Classical dressage is the discipline where contradictory pressures are usually applied, for example asking the horse to go forward but at the same time slowing the pace, or where a permanent pressure is applied, to make the horse assuming certain postures and/or paces. A critical aspect in this discipline is the technique known as *on the bit*: the rider applies a high pressure on the reins and bit. Consequently, the horse is forced to flex and arch its neck and so it has the nose very close to its chest, leading to the highest flexion of the neck in the cervical vertebrae n. 3, 4 and 5, causing pain, discomfort, and stress to the horse. This is seen as advantageous only for the rider, because it changes the tonus of back muscles of the horse, creating a softer back, so a more comfortable sit for the rider. Furthermore, this factor of applying pressure to arch the

neck may create a state of confusion in the horse, because pressure on the reins and bit signifies also to stop or slow down the gait, hence causing conflict behaviors. It also raises some deficits during training, i.e. that the quality of stop/slow down signal declines.

Also with round-pen training methods there are some negative points. They can compromise the welfare of the horse because the fact of chasing the horse and using negative reinforcement may increase the level of arousal of the horse, until it is in a situation of distress. In addition, there can be other risks, not only for the horse, but also for the trainer itself: the continuous chasing by the handler can instigate more flight responses by the horse, that can feel stressed, anxious, and threatened, i.e. it can kick and strike, or aggressive responses, also when the handler approaches it. This can raise until learned helplessness, that in turn is seen as stubbornness and so the horse is punished for this. Furthermore, by chasing continuously the horse for lots of time, can lead it to physical and mental tiredness, therefore the horse has reduced learning capacities (*Fenner et al., 2019, pp. 88-91*).

Outside all these techniques, training methods and the discipline of classical dressage, there are other general factors important to consider, about discomforting techniques and equipment applied during training sessions, competitions and exhibitions. A discomforting technique usually used in the exhibitions in show-rings (in general with Arabian horses) where it is required a raised tail posture, is the so-called *gingering*. Handlers, owners or trainers use an irritant, usually it is a peeled ginger, directly in the rectum zone of the horse, and this causes rectal discomfort and the subsequent raising of the tail. Sometimes in jumping shows or in show-rings, competitors and riders may also use some sedatives and nerve blocks to reduce the movement of the tail and to calm down the horse, and this can be critical especially in jumping competitions both for the horse itself and for the human, because the horse does not have full control of its motion, so it moves unsafely (*McGreevy and McLean, 2010*).

Equally some equipment, such as nosebands, whips and spurs, can represent a negative aspect during horse training sessions or exhibitions. Nosebands keep the mouth of the horse closed, so it does not have the possibility to relax its jaws, being a stress and discomfort for it. Whip and spurs, as said before for positive punishment, if are used too often or too strongly, they stress and can cause pain to the horse (*McGreevy and McLean, 2010, pp. 188-194*).

## 5. Conclusion

My thesis focused on the different techniques and methods of training in the world of horses and equitation, and on the positive and negative aspects these techniques and methods carry. The technique with the most positive training aspects and outcomes is positive reinforcement, which provides for the presentation of a pleasant stimulus, such as food reward, after the horse performs the requested exercise and/or behavior. This is one of the best techniques because horses trained with this one have no or very few stress-related behavior, they have less agonistic and avoidance behaviors and they are more brilliant, in the sense that they learn faster and remember better the exercises. Regarding the relationship with the trainer, rider or handler, but also with an unfamiliar person, it is the one that increases this connection, by enhancing also contact-seeking behavior and curiosity by the horse. Furthermore, it may be considered the best one also because it is essential for the mental status of the horse, i.e. it keeps it busy not only physically but also mentally. Positive reinforcement is also used in the field of rehabilitation program with rescued horses, because it does not further stress them, being that these subjects have already suffered of chronic stress and human maltreatments in their past, and so it helps them to regain the confidence and get closer to humans again. Regarding the training methods, instead, the sympathetic, called also natural horsemanship, more or less has the same benefits. It is the most ancient declination of the conventional training method. It is called sympathetic because the trainer expresses its sympathy, its comprehension towards the horse, so it is not based on the forced obedience by the horse, but on a pure relationship between them, by respecting the natural behaviors of the horse. This approach results in a more relaxed and less stressed and tense horse.

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