



Behavioral management of puppies in training as military dogs

Lorenzo Tidu^{a*}, Giuseppe Spinella^b, Alessandro Parco^c

^a *Comando Divisione Vittorio Veneto, Firenze (Italy);*

^b *Dipartimento di Scienze Mediche Veterinarie, Università di Bologna (Italy);*

^c *CEMIVET, Grosseto (Italy).*

Abstract: Military dogs, besides being exposed to stressful events during operations (loud noises, transport, exposure to high and low temperatures, etc.), can be involved in explosions and/or gunshot wounds.

Breeding, selection and management of working dogs are specific activities that involve a deep knowledge of different disciplines such as genetics, animal husbandry, internal medicine and applied ethology.

This study aimed to provide specific guidelines on the breeding and behavioral management of German Shepherd and Belgian Malinois military dogs, from birth to the seventh month of age.

The deep knowledge of the dog from the point of view of applied ethology and the psychology of learning, beyond a natural predisposition to interact correctly with the dog, are the most important topics for a good canine trainer; education and dog training are only a direct and natural consequence of this.

Key Words: puppy, behavioral management, military dogs.

* *Corresponding Author:* lorudit@virgilio.it

Introduction

Military dogs, besides being exposed to stressful events during operations (loud noises, transport, exposure to high and low temperatures, etc.), can be involved in explosions and/or gunshot wounds. They could be injured or witness the injury of other dogs or of their own handler.

In these conditions, some dogs may develop phobia and panic attacks, i.e. similar to conditions reported in humans as post-traumatic stress disorder.

However, not all dogs develop behavioral pathologies, and this could be related to genetic factors, breed predispositions, previous experiences during the socialization period and to the specific relationship with their handlers.

Breeding, selection and management of working dogs are specific activities that involve a deep knowledge of different disciplines such as genetics, animal husbandry, internal medicine and applied ethology.

Few scientific studies have dealt with the breeding and selection of working dogs for public utility (Tidu et al., 2002), but many studies have investigated the effect on behavior of the physical and social environments in which the puppy is managed daily (Lezama-Garcia et al., 2019; Guardini et al., 2016; 2017).

This study aimed to provide specific guidelines on the breeding and behavioral management of German Shepherd and Belgian Malinois military dogs, from birth to the seventh month of age.

Management of bitches

The reproduction and breeding area must be separated from other divisions of training and adult kennels.

The separation of this area provides correct sanitary isolation and guarantees a suitable environment for gestating/lactating females and growing puppies.

Generally, puppies spend a lot of time sleeping (90% of the time in the first week of life) and much of their sleep is paradoxical sleep (95% of total sleep) (Gazzano, 2013).

Growth hormone (GH) secretion in different animal species occurs with spontaneous secretion peaks during paradoxical sleep. In this phase, the inhibition of the release of somatostatin occurs and results in the release of GH. The release of GH is therefore linked to sleep and not to the light-dark cycle and for this reason, is conditioned by management factors (Van Caeter & Refetoff, 1985). Isolation and quiet space, therefore, allow puppies to grow better.

The bitches must be housed in single kennels, possibly with a linear disposition. Inside the kennels, there is an antechamber area, in which food and water are administered; laterally and further inside, there is a more protected area: the 'birth area', made of waterproof and washable wooden material covered with non-toxic paint.

Ambient heating is provided by an infrared lamp, secured to the ceiling.

The bitches' kennels are equipped with a closed-circuit camera for remote monitoring of the behavior of the bitch during labour and of the puppies.

In front of the kennels are fenced lawn areas, suitable for hosting dogs for a period in which the daily cleaning and cleansing of the kennels is carried out.

The playful, training and educational activities of the puppies take place in a large area of lawn, adjacent to the area where the kennels and walkways are located.

These areas are equipped with masonry rubble to simulate disastrous urban environments, circuits and paths for overcoming physical obstacles and are enriched by both known and unknown objects.

Two months before the start of the estrous cycle, the bitch is transferred to the facilities of the reproduction and breeding area.

After mating, the bitch receives two vaccine doses of canine herpesvirus antigen (F205 strain). The first dose is given about ten days after mating, while the second dose is administered one or two weeks before the expected date of delivery.

The diagnosis of pregnancy is made around the twenty-fifth day of ovulation, with an abdominal ultrasound examination.

The bitch continues to carry out normal basic training and play activities even during the gestation period, as this allows her to maintain her mental and physical fitness. On the other hand, any type of training in searching for explosive substances is prohibited as there are currently no data suggesting the absence of a teratogenic effect of substances absorbed by contact, inhalation or ingestion by a pregnant bitch.

Handling of puppies

The puppy is handled by a specialized staff member for five minutes a day, from the second week to the end of the third week of life; the fingers are gently passed over the gums, the auricles are massaged, the limbs and paws are palpated. This practice has the purpose of obtaining a habituation to handling that should allow better management of the dog, also for when the adult dog will be managed during medical examinations and common practices (Gazzano

et al., 2008). This form of manipulation of cutaneous and mucosal tissues aims to guarantee a sensory homeostasis at higher levels allowing the adult dog to wear, without discomfort, some devices used during work, such as protective shoes for rubble or anti-UV glasses, for dogs that are more predisposed to develop keratoconjunctivitis sicca.

During this period, the dedicated staff must ensure and guarantee that: the puppy sucks milk regularly, the bitch produces enough milk for all the puppies in the litter, and defecation and urination with perineal stimulation (Ogi et al., 2021).

Socialisation of puppies

From the third week to the fourth month of age, the puppy is ready to deal with the 'socialization period'.

The tendency to isolate the puppy before completing the vaccination cycle, to prevent the onset of infectious diseases, is not an advisable practice. Puppies, born and nursed by regularly vaccinated bitches, enjoy, up to the eighth week, the coverage of colostral antibodies and therefore, can and must carry out the social and environmental experiences necessary in this phase of development.

The weaning of the puppies, which coincides with dental eruption (the period in which the 'first detachment' occurs), begins around the fourth week of age. The feed used for weaning is the same used for feeding the bitches during pregnancy and lactation. However, prenatal dietary orientation in the dog is well known (Pageat, 2009).

The puppies are kept separate from bitches for gradually increasing times, starting from the fourth week of age. However, it is important to keep the puppies with the siblings and the bitch until the fifth week, as in this period they learn to modulate the bite. Contact with the bitch is also primary after weaning for learning basic social rules and the acquisition of self-control. In this period, the puppies engage in pseudo-competitive and aggressive forms of play, in which they use signals of dominance or submission; these activities also allow them to learn to inhibit, through the mutual use of negative punishments, their ability to inflict pain (Dehasse, 1994). Around the sixth week of life, the puppies are permanently removed from their mother. The litter remains together until the third month of life to guarantee the puppy's intraspecific play.

The breeder, a marginal figure in the 'neonatal period' and in the 'transition' period, becomes a point of reference for the puppy at the time of weaning. There are different times and ways in which detachment occurs for puppies of different sexes (Verga, 1993).

Once the puppy has gained confidence with the breeder, interspecific socialization can begin. The puppy has the maximum ability to socialize with humans between the fifth and seventh week and the tenth week of age.

The breeder, after weaning, becomes a 'safe base' for the puppy (Riggio et al., 2021; Mariti et al., 2013; 2018; 2020; Carlone et al., 2019) who can explore the environment, interact with other individuals and learn new social skills (Tidu et al., 2002).

At the beginning of the socialization phase, puppies tend to approach social stimuli, while later, from the eighth week, this response is reduced, leading to an avoidance reaction to unknown stimuli (Bradshaw, 1990). For this reason, it is desirable that the breeder's socialization activity starts early, at the beginning of the recommended period.

From the second half of the third month until the puppy passes to the training section, the dog is exposed regularly and always in the presence of the breeder, to new environments and new situations.

Training protocol

Training module 1 (getting the puppy used to travelling uneven surfaces and training it to overcome small obstacles)

The puppy, as a childlike type, creates a gradually increasing emotional bond with the *role model*: the breeder. The puppy, in the presence of the breeder, can explore, interact with the external environment and is more predisposed to play with its brothers/sisters and with strangers in different, new or unusual environments.

In this way, it is possible to teach the puppy to move in environments with different types of surfaces or to overcome physical obstacles with increasing degrees of difficulty.

The puppy learns, in particular, to overcome physical obstacles such as small stairs and small tilting platforms, to walk on uneven or wet surfaces, to enter dark or closed places.

To attract the puppy to new environments and to encourage it to overcome the proposed obstacles, the attractive power of the role model, food or the 'social facilitation' provided by the presence of the litter siblings is generally exploited.

This training module begins to be implemented starting from the fourth week but continues, from the didactic point of view, up to the tenth week.

Training module 2 (teaching the puppy how to use the sense of smell)

During the period, in which the puppy is performing exercises of training module 1, it can simultaneously begin training module 2.

This module involves the use of food reinforcements, administered when the puppy has been able to perform the intended task, for example, to identify dog treats through the use of smell alone.

Training module 3 ('push and pull' game)

From the third month of age, the puppies learn to play with the breeder in a competitive way. This type of game exploits the possession and predatory motivation of the puppy, so that it enters competition with the handler to conquer a toy.

The push and pull exercise can be later associated with the 'take and leave' exercise.

Training module 4 (progressive habituation to strong and sudden acoustic stimuli)

When the puppy has reached the age of four weeks it is exposed to loud sounds to which it must learn not to direct its attention or to have reactions of fear.

This state of emotional stability is reached gradually while the puppy is concentrating on a specific activity, that completely occupies its attention (for example, the olfactory search for food).

When the puppy has learned to completely orient itself towards the human model (handler) and when it is able to perform what is foreseen in training module 3, then, as a distracting activity, it is desirable that food be replaced by social play.

Training module 5 (getting used to new sensory stimuli using social games)

Social play is a method used as a reward, also in the training of adult dogs, as it has a very powerful reinforcing ability.

For this reason, the distracting use of social play is indicated for learning not to react in contexts where it is necessary for the dog to remain emotionally calm and relaxed or when, in the work environment, where annoying and high-volume acoustic and distracting stimuli are present.

This way of learning without reaction (habituation) is not just about acoustic stimuli. All described concepts must also be applied in other contexts, such as for habituation to travel in aircraft with rotating and fixed wings, on vehicles or on boats.

Training module 6 (search for objects in new environments)

The dog training module to operate in closed and new environments has to be faced by dogs that have reached at least ten weeks of age.

To have an optimal performance, it is essential that the puppies are motivated to interact with the reference model (human model) and to play in a competitive way with them.

In this module, the puppy is taught to search for its favorite toy through the sense of smell in dark or new places. These environments represent a further difficulty for the dog in carrying out the exercise as the dog feels uncomfortable in the transition from light to dark or in an unfamiliar place.

If the dog has a strong social play motivation, it will be able to overcome these difficulties more easily. For this reason, this specific activity must be proposed only after a strong emotional bond with the reference model has been established, such that its presence represents a safe basis for the dog and gives value to social play.

Specific exercises of this training module continue until the puppy passes from the breeder to the handler, who will activate the specific training work. During this long period, exercises will be modified and intensified, increasing in difficulty. For this reason, this phase ends when the dog has reached seven months of age.

Conclusions

Breeding and management of dogs in kennels and the modality of activity administration being conducted, can affect the well-being and performance achieved during training.

However, there are still doubts on the specific role that the breed plays in the onset of behavioral pathologies. It is not possible to remove the working dog from the stressors to which it is exposed or to act on the elimination of these in the environment in which the dog has to operate or live. It is necessary that the dog can perceive stressors in the correct modality, so that these do not alter its equilibrium (Weiss, 1972).

The presence of the 'secure base', which generally coincides with the figure of the breeder, first, and the handler, subsequently, helps to lower the level of discomfort in dogs exposed to high-level stressful stimuli.

The observation for the same type of stress to act in different ways in different animals, and how this can happen, is related to behavioral development and building the emotional bond between the dog and its handler. However, it cannot be excluded that breed contributes greatly to the acquisition of this ability.

Ultimately, the handler plays a fundamental role in the management of the dog as well as the breeder who is important in influencing the behavioral development of the puppy.

The deep knowledge of the dog from the point of view of applied ethology and the psychology of learning, beyond a natural predisposition to interact correctly with the dog, are the most important topics for a good canine trainer; education and dog training are only a direct and natural consequence of this.

References

- Bradshaw J.W.S. & Brown S.L. Behavioural adaptations of dogs to domestication. *J. Small Anim. Pract.* 31: 18-24; 1990.
- Carlone B., Sighieri C., Gazzano A., Mariti C. The dog (*Canis familiaris*) as part of the family: A pilot study on the analysis of dog bond to all the owners. *Dog Behavior.* 5: 1-14; 2019.

- Dehasse J. Sensory, Emotional and Social Development of the Young dog. *Bull. Vet. Clin. Ethol.* 12: 6-29;1994.
- Gazzano A., Mariti C., Notari L., Sighieri C., McBride E.A. Effects of early gentling and early environment on emotional development of puppies. *Appl. Anim. Behav. Sci.* 110: 294-304; 2008.
- Gazzano A. (2013). *Manuale di etologia del cane*. Edizioni ETS, Italy.
- Guardini G., Mariti C., Bowen J., Fatjó J., Ruzzante S., Martorell A., Sighieri C., Gazzano A. Influence of morning maternal care on the behavioural responses of 8-week-old Beagle puppies to new environmental and social stimuli. *Appl. Anim. Behav. Sci.* 181: 137-144; 2016.
- Guardini G., Bowen J., Mariti C., Fatjó J., Sighieri C., Gazzano A. Influence of maternal care on behavioural development of domestic dogs (*Canis familiaris*) living in a home environment. *Animals.* 7: 93-98; 2017.
- Lezama-García K., Mariti C., Mota-Rojas D., Barrios-García H., Gazzano A. Maternal behaviour in domestic dogs. *Int. J. V. Sci. Med.* 7: 20-30; 2019.
- Mariti C., Ricci E., Zilocchi M., Gazzano A. Owners as a secure base for their dogs. *Behaviour.* 150: 1275-1294; 2013.
- Mariti C., Carlone B., Sighieri C., Campera M., Gazzano A. Dog behavior in the Ainsworth Strange Situation Test during separation from the owner and from the cohabitant dog. *Dog Behavior.* 4: 1-8; 2018.
- Mariti C., Lenzini L., Carlone B., Ogi A., Gazzano A. Does attachment to man already exist in 2 months old normally raised dog puppies? A pilot study. *Dog Behavior.* 6: 1-11; 2020.
- Ogi A., Mariti C., Pirrone F., Baragli P., Gazzano A. The influence of oxytocin on maternal care in lactating dogs. *Animals.* 11: 1130; 2021; <https://doi.org/10.3390/ani11041130>.
- Pageat P. 1999 *Patologia comportamentale del cane*. Le Point Veterinarie Italie (Ed), Milano.
- Riggio G., Gazzano A., Zsilák B., Carlone B., Mariti C. Quantitative behavioral analysis and qualitative classification of attachment styles in domestic dogs: Are dogs with a secure and an insecure-avoidant attachment different? *Animals.* 11: 1-23; 2021.
- Tidu L., Alù A., Palestrini C., Di Mari W., Teodoro M. L'addestramento antidroga del Pastore Tedesco della Guardia di Finanza; confronto di risultati in addestramento tra due gruppi di cani allevati in modo differente. *Bollettino AIVPA.* 2: 37-47; 2002.
- Tidu L., Spiezio C., Prato Previde E., Palestrini C., Verga M. Behavioural and physiological (heart rate) responses during strange situation test in two groups of drug dogs. 4th Int. Vet. Behav. Meeting. Caloundra Australia. pp. 209-211; 2003.
- Van Cauter E., Refetoff S. Multifactorial control of the 24-hour secretory profiles of pituitary hormones. *J. Clin. Invest.* 8: 381-385; 1985.
- Verga M. Il comportamento degli animali da compagnia: realtà e fantasia. *Veterinaria.* 7: 43-47; 1993.
- Weiss J.M. Psychological factors in stress and disease. *Scientific Am.* 226: 104-113; 1972.

Behavioral management of puppies in training as military dogs

Lorenzo Tidu, Giuseppe Spinella, Alessandro Parco

Sintesi

I cani militari, oltre ad essere esposti ad eventi stressanti durante le operazioni (rumori forti, trasporto, esposizione ad alte e basse temperature, ecc.), possono essere coinvolti in esplosioni e/o ferite da arma da fuoco.

L'allevamento, la selezione e la gestione dei cani da lavoro sono attività specifiche che comportano una profonda conoscenza di diverse discipline come la genetica, la zootecnia, la medicina interna e l'etologia applicata.

Questo studio mira a fornire linee guida specifiche sull'allevamento e la gestione comportamentale dei cani militari Pastore Tedesco e Malinois Belga, dalla nascita al settimo mese di età.

La profonda conoscenza del cane dal punto di vista dell'etologia applicata e della psicologia dell'apprendimento, oltre ad una naturale predisposizione ad interagire correttamente con il cane, sono gli argomenti più importanti per un buon addestratore cinofilo; l'educazione e l'addestramento del cane sono solo una conseguenza diretta e naturale di questo.