

Occurrence of Psychosis in Dogs Reared in House, Farm and Kennels

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Abstract

This ethological study was carried out to establish the occurrence of psychosis in dogs, reared both in-home (as a pet) and in dog kennels. The dogs housed in kennels were reared either individually (as working animals) or in groups (in kennels). All the pet dogs were reared alone in the households. The highest occurrence of psychotic states was encountered in stray dogs housed in kennels and followed by the pet dogs. These states were very rarely observed in individually reared dogs at farms and working dogs. The possible explanation is that they were submitted to less stressors due to good management at farms and the proper approach on the basis of their temperaments, i.e. their welfare was at the highest level.

Keywords: disease occurrence, kennel, pet dogs, psychosis, stressors.

1. Introduction

It is proven that animals are sentient beings. This is the concept lying at the background of the theory of animal welfare – an entity comprising three elements: hygienic-ecological, ethological and humane [1]. The ethological aspect is related to animal behaviour, which differs substantially in dependence of rearing conditions, especially when they are not compliant with their biological needs [2]. The discrepancy between rearing technology of a given animal species and category (dogs in particular) always results in behavioural alterations, the major part of which are pathological [3]. The most dangerous ethological deviations are of psychic nature, the so-called

psychoses [4], because the dog is a social animal and thus, men are also affected [5].

Dogs are reared either individually (as pets) or at farms (kennels with different capacity). In both instances, psychotic events are possible following errors in rearing, especially in the proper primary and secondary socialisation of dogs, related to the determination of its temperament type [6].

It is established that psychoses are less frequently encountered in home-reared dogs compared to those kept in farms [7]. For the majority of people, pet dogs are true family members [8]. The bond between the man and his pet is so strong that the latter is even attributed human traits – the phenomenon is called anthropomorphism [4].

For dogs reared at farms, the things are somewhat different [9]. The dog is among its own. This fact has a strong influence on its behaviour as well as its secondary socialisation, especially if primary socialisation was not adequate [10]. The nervous

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system of dogs is affected, with further influence on canine psychics. The commonest psychotic states are tics, mania, depressions and fear, with consequently developing aggression, altered vocalisation [11]. The aetiology of these states is clear – they occur subsequently to erroneous rearing conditions (here we could include the habitual aggression from men and other animals to dogs). These factors are identified as stressors. If their influence is more prolonged or continuous, psychoses may become irreversible. Often, such states are manifested at a large scale and irrevocably due to the behavioural imitation element – i.e. conditions for occurrence in many subjects [12]. In result, a somatic pathology affecting the economic quality and purpose of the dog could be observed.

The clinical signs of psychosis are quite various – hyperactivity with the tongue, self-sucking, moving in a circle, excessive and fast irritation, overexcitement, opisthotonus, abnormal vocalisation, fear followed by aggression etc. Psychoses are accompanied by neurological signs, impeding their proper diagnostics.

The review of the literature makes clear that these states are species-related, of various symptoms, very stubborn and even untreatable. However, there is no answer to the questions where and why psychotic states are more common – in dogs reared as pets or in farms? The ethological nature of the problem is neither clear. This was the incentive the present investigations about the occurrence of psychoses in home-reared and kennel-reared dogs.

2. Materials and methods

Animals and housing

The subjects of this study were 60 dogs, aged from 12 months to 6 years housed in three different rearing conditions, during April. Twenty of dogs were reared in households as single pets and another 20 of them were individually kept at farms as a working. The remaining 20 dogs were reared in groups in shelters after they were determined as stray dogs.

All of the pet dogs were belong to four breeds – Dachshund (n=5, all of male), Cocker spaniel (n=7, all of female), Pinscher (n=3, 1 male and 2 female) and Labrador (n=5, 3 male and 2 female). The dogs were housed individually, as single pets and they were fed twice a day and were taken out

for a walk after each feeding. The pet dogs were with unknown to owners' temperament (nervous system, personality).

All of the 20 working dogs reared in a state-owned municipal farm were only German Shepherd Dog breed (1 – 5 years old) and were male. They were housed individually in kennels that included an indoor section (2.2 m²) and an outdoor section (6.6 m²). The enclosures were totally covered by a roof, and had visually transparent fencing at the front. Adjacent pens were separated by 0, 8 m high solid partitions with wire mesh above. Coefficient of thermal conductivity of building materials used for made the floor vary between 1, 4 – 1, 7 W/m*K (concrete, reinforced concrete) and used for walls - 1, 92 W/m*K. These enclosures had access to a common fenced area (110 m²) with sea sands where dogs were allowed to exercise in pairs for 1- 2 h/day, usually in the morning during cleaning routines. The animals were fed and cleaned twice a day.

Stray dogs were 20 mixed-breed dogs (12 male and 8 female), selected among a pool of 80-110 dogs regularly housed in the shelter described below, on the basis of length of stay in the shelter (1-12 months), age (1-6 years) and health conditions (unhealthy animals were excluded). The 20 subjects included strays and dogs left by the owners that did not want them anymore. Dogs were residents in Public Shelter “Dolni Bogrow” in Sofia. All animals were spayed or neutered. The dogs were housed in groups 4-6 animals of both sexes in four outdoor enclosures of about 24 m² each (4x6 m). See-through wire mesh ran along all sides of the enclosures. The pens were adjacent to one another. An 8 m² roof, with kennels underneath, covered a portion of the pen (1/3) to give protection from the sun and bad weather. The floor was made from concrete. Dogs were fed and clean once in the morning (around 8.30 a.m.) with dry pellets, and fresh water was available at all times by caretakers. During their stay in the shelter the dogs were taken out of the boxes for a walk in fenced areas within the shelter. Each dog was identified and described in an individual file that reported: roll-number, colour, breed, date of arrival in the shelter and age.

The microclimatic rearing conditions were determined by routine methods. They were measured in the living space of dogs. The temperature, relative air humidity and the velocity of the air motion were measured by Environment

Meter PCE – EM 883 three times daily – 7.00 AM, 2.00 PM and 9.00 PM. The concentration of ammonia and CO₂ – by indicator tubes and a Dräger ammonia and CO₂ sensor on indicated hours (Table 1).

Behavioural observations

Data were collected using the focal animal sampling method [13]. The observations were made using a check sheet recording all occurrences [13] of the selected behaviour patterns of one dog (the focal animal) by means of an ethogram that consisted of several behaviour patterns (Table 3). The ethogram used in this research was based on the description of dog behaviour [14 - 17] and on the behaviour of other species [18 - 20]. In Table 3 are indicated behavioural patterns that are associated with stress and psychoses [21]. These behaviours were: repetitive pacing; wall bouncing; tail chasing; circling; chewing bedding; self-licking; polydipsia; panting; lack of appetite; listlessness; escape attempts; hiding; chewing bars; coprophagy; changing from one state of locomotion to another, sitting, standing, nosing [22]; whining [23]; aggression to conspecifics [17] and startling [24]. All of these behaviours were included as indicators of negative emotional state and were recorded by video camera.

Behavioural data were collected by video recording dogs' activities during two daily sessions, for three consecutive days: 30 min in the morning before feeding time (08.25h-00.55h) and 30 min in the afternoon (17.00h-17.30h). All recordings were carried out in the absence of staff activities, cameras were fixed and an operator was in charge of turning them on and off, leaving the place during recordings. Since dogs can react more intensely to the arrival of a human attendant [25], the first and the last 5 min of each recording session were discarded from the analysis. Pet dogs were observed alone, without their owners, at home. Video analyses were carried out using a dedicated data recording system (The Observer XT 8.0, Noldus, The Netherlands) on the basis of an existing ethogram (Table 3). Behavioural frequencies and duration of occurrences were recorded continuously during each 30 min observation bout, for a total of 180 min of recordings for each time period and for each of the 60 dogs included in the study.

Temperament testing

To determine the temperament of the dogs was used Test of Toman – fifth variant of temperament typing of farm and pet dogs and for assessment of their behaviour [26].

Table 1. Average microclimatic parameters registered during the research

Housing conditions	Ambient temperature (°C)	Air humidity (%)	Air velocity (m/s)	NH ₃ (ppm)	CO ₂ (%)
Shelter	9.93±0.64	66.33±3.64	0.50±0.06	1.65±0.33	0.043±0.003
Farms	13,68±1.18	68.07±2.59	0.49±0.08	1.54±0.25	0.056±0.004
Home	19.44±2.5	54.42±2.68	-	-	-
Reference values*	15.5 – 26.6	30 - 70	0.3 – 1.5	<2	0.25-0.3

Table 2. Temperament types of dogs used for research (Test of Toman)

Temperament type	L	F	G	A
Pet dogs	60%	30%	10%	0%
Working dogs	100%	0%	0%	%
Stray dogs	10%	20%	25%	45%

L – sanguine; F – choleric; G – phlegmatic; A – melancholic (asocial)

3. Results and discussion

Figure 1 and 2 indicates that stray dogs reared in dog shelters were the most showing abnormal (psychotic) behaviour. The second highest rate was determined in pet dogs, and finally lowest rate in working dogs from the farm.

The results confirmed our anticipations with respect to psychotic disease rates only in stray dogs from shelters, which exhibited the highest occurrence.

At the time present it is missing in scientific literature comparative studies and data about the frequency of manifestation of neuro-psychotic

pathology in dogs raised in the concrete growth conditions of our experimental animals and it is not possible to make any comments comparing (with reference to precedent researches) the achieved results. However we emphasize the fact

that we are surprised by the higher psychosis morbidity in pet dogs than the working dogs. What is the explanation of the presented scientific facts?

Table 3. Ethogram of domestic dog (*Canis familiaris*)

Behaviour	Description	Reference	
Pace repetitively	Dog repeatedly (>3 times) paces around kennel in a fixed route	Stephen and Ledger (2005)	
Wall bouncing	Dog repeatedly (>3 times) jumps up kennel wall from one side to another		
Tail chasing	Dog chases its tail repeatedly (>3 times)		
Circling	Dog repeatedly walks around in small circle (>3 times)		
Chewing bedding	Dog chews its own bedding		
Drink excessively	Dog drinks large volumes of water, in excess of what is normal		
Lack of appetite	Did the dog eat over half it's food?		
Autogrooming	Behaviour directed towards the subject own body, like scratching, licking and self-biting		
Escape attempt	Dog attempts to escape kennel in a forceful manner whenever the kennel door is opened		
Hide	Dog is obscured from view of kennel staff, behind its bed or other kennel furniture for prolonged periods when not asleep (>2mins)		
Chewing bars	Dog repeatedly chews and bites at the bars of the kennel (>20secs)		
Coprophagy	Did the dog eat its own or another dog's faeces?		Beerda et al. (1999)
Aggression	Any lip lifting, growling, snapping, or biting		
Fearfulness	Fear from sudden sounds, strangers, other animals etc.		
Startle	Legs flex briefly, and body and head quickly and briefly move back, usually in response to a sudden noise, or dog quickly moves backwards a few paces	Hiby et al. (2006)	
Oral behaviours	Includes tongue out; tip of tongue briefly extended; snout licking; lip licking; swallowing, lip smacking	Beerda et al. (1998)	
Whine	High pitched vocalisation	Walker et al. (2009)	
Nose	The nose is held close to or touching a surface, and/or sniffing the surface		

Microclimatic parameters deviated from veterinary norms only as the coefficient of thermal conductivity of building materials of the shelter was concerned. It was found to be high (concrete) and directly responsible for the discomfort of dogs. They were reared in groups, but the temperament type has not been previously determined which resulted in hierarchical incompatibility within the group in the box. The standard about living area per animal of 4 m² was not met (in the study, the individual area was 2.5 m²). Due to the fact that psychotic states are consequent of the negative influence of the so-called stressors [27], we could conclude that housing had a great effect on their occurrence because of very different and hierarchical incompatibility dogs kept together [28]. The

cohabitation of sanguine, choleric, melancholic (asocial) and phlegmatic dogs is difficult. Their successful secondary socialisation, if possible at all, takes a very long time. According to our results, the animal developed psychotic states (Figure 1) – aggression, abnormal vocalisation (whining), fear, licking objects or body parts, especially the extremities). Here arises the question which stressor is more powerful for stray dogs: the low-quality of their living environment or the hierarchical incompatibility within the groups? In our opinion, the latter factor (incompatibility due to lack of temperament typing) was leading with respect to the occurrence of psychoses. This is further supported by the fact that in the working dogs farm, the structure of boxes was similar to that of the shelter but dogs

were reared individually and play in pairs daily, the hierarchical incompatibility was avoided and

thus, the prevalence of psychotic states was the least.

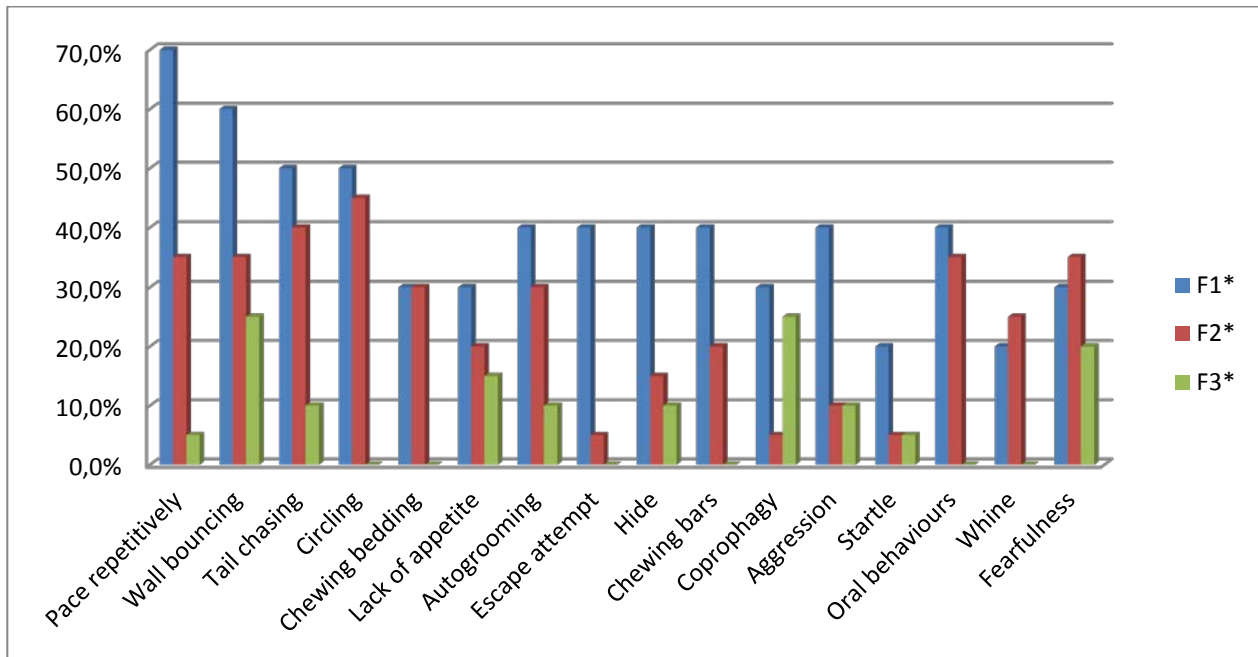


Figure 1. Type and frequency of psychosis episodes at home-reared and kennel-reared dogs (F1 – Stray dogs housing in shelters; F2 – pet dogs, housing at home; F3 – working dogs, housing at farms)

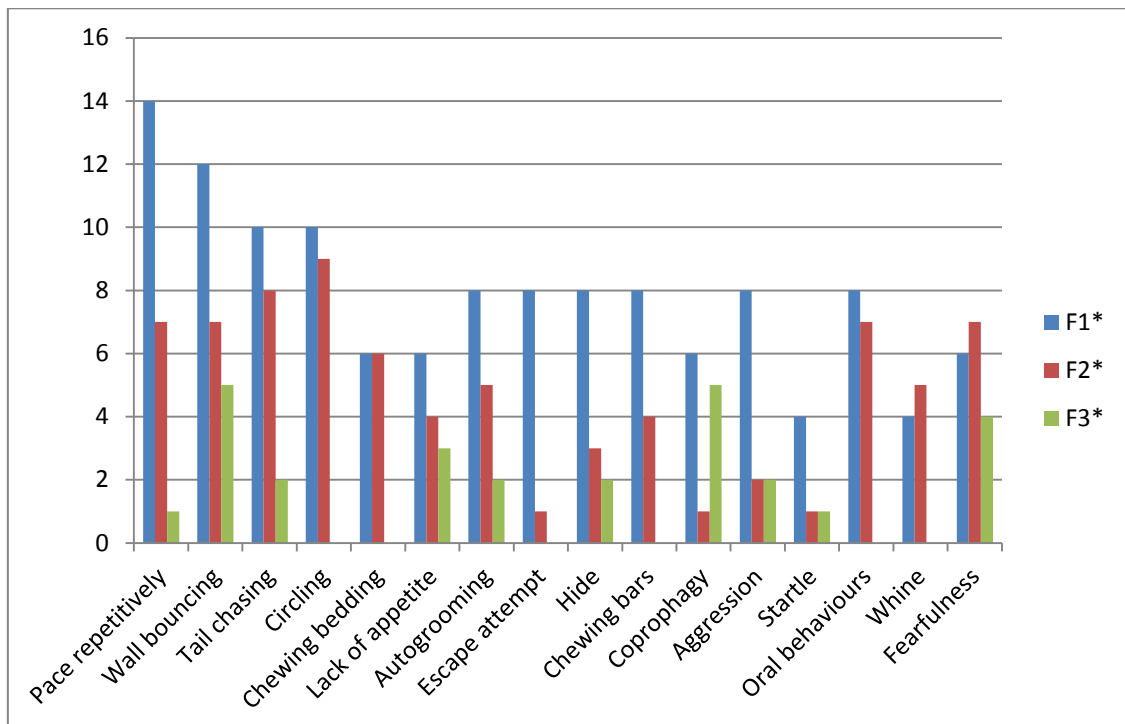


Figure 2. Number of dogs with psychotic behaviour patterns from three different rearing conditions (n=20 for each group)

Therefore, the structure or the technological solution had a minor influence on psychosis occurrence compared to the hierarchical incompatibility in group boxes (shelter) emerging subsequently to the lack of temperament type determination and the insufficient individual area per animal.

As the prevalence of psychoses among domestic dogs was concerned, our preliminary expectations were not confirmed. We initially believed that the individual approach to each pet and the microclimate near to the optimum one according to veterinary hygiene norms would result in the lowest psychotic behaviour rate. Nevertheless, these states were at the second place in pet – dogs (Table 4, 5). The explanation could be attributed to the fact that the owners of affected dogs are not aware of their temperament and hence, the approach to dogs was inadequate, i.e. they aimed to achieve a desired behaviour over a short period of time. A discrepancy between the owners' desire to build a specific model of behaviour and the time required for its realisation occurs. In this case, the owner itself becomes a stressor for the dog, as could be seen from registered psychotic states (Table 4) – first, repetitive or stereotypic behaviours, oral behaviours, followed by fear and unusual vocalization (whining). These behavioural disorders are associated most often with the absence of social interactions with conspecifics and they are more susceptible to the occurrence of stereotypes and psychoses [28].

Therefore paramount importance for the emergence and development of the described pathology is untyped nervous system, not so the micro-climatic conditions of animal growth. Defining the temperament of the animal and primary socialization is a process which must be realized between 3rd week and 3rd month of age [29, 26]. If the type of nervous system is known, the influence of the so called “hierarchical incompatibility” in dogs reared in groups should be avoided.

4. Conclusions

Typifying the dog's nervous system must become an imperative process in the practice since it is with primary significance regarding the frequency of psychosis manifestation and it is a part of providing the well-being of the present animal and human safety. In households, owners should adopt

a proper approach to the dog according its temperament. The development of behavioural deviations would be strongly reduced and thus, one of the main causes for the existence of a large number of highly aggressive stray dogs (as evidenced by the numerous accidents with severely bitten people) would be eliminated.

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