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SOME OF SEMEN PHYSICAL PROPERTIES (VOLUME AND MOTILITY) OF GERMAN SHEPHERD DOGS REARED IN IRAQ DURING DIFFERENT MONTHS OF THE YEAR.

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Abstract:A total of five German shepherd dogs were selected for Breeding Soundness Examination (BSE). From the resources of the Iraqi Ministry of Interior, all of them live in uniform living conditions, and are subject to constant veterinary supervision. The collection was weekly from each dog, and 120 ejaculations were collected during all months. In this study, we studied the physical properties (volume, mass motility and individual motility) of the seminal fluid of the German Shepherd dogs (GSD) breed during the six-month period (October, November and December 2019) and (January, February and March 2020). The method of semen collection was by digital manipulation. It was recorded that volume, mass motility and individual motility show significant differences at level of ($P<0.05$) in six-month of the study. total semen volume (ml), total Mass motility (Scale 1-5) and total Individual motility (%), were 32.8±1.444482 ml, 3.308333±0.001792 and 87.75±0.216562, respectively. In the present study all the German shepherd dogs were affected by climatic conditions and temperature changes inside Iraq. But it is suitable for future reproduction.

Keywords: German shepherd, Iraq, semen, volume, motility.

INTRODUCTION

The domestic dog belongs to the Canidae family, consisting of 35 related species that diverged within the last ten million years (Wayne *et al*., 1997; Ostrander and Wayne, 2005). The German shepherd origin from Germany (Kern, 1994). Today a working dog (guarding, defense, tracking, etc.) and an all-purpose service dog, as well as a family dog (Coutts and Harley, 2009; Tenner, 2017). In most mammalian species, reproductive capacity peaks in selected seasons. The sexual activity of males is triggered mainly by changes in day length (Malpaux *et al*., 2000). Clear seasonal changes in semen quality are observed in undomesticated canids (Minter and DeLiberto, 2008). The seasons of the year have an effect

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on concentration of sperm per ejaculate as mentioned by (Taha *et al*., 1981). It has been shown that the sperm concentration can be influenced by season but the libido, volume of the ejaculate, and percentage of dead and abnormal spermatozoa was not influenced by season (Taha *et al*., 1981), and it is likely that there is a correlation with different environmental and climatic conditions. It has been reported that, in the tropics, seasonal variations influence ejaculate volume, total sperm count, and motility in stray dogs (Takeishi *et al*., 1980). Whether a mammal reproduces seasonally or continuously depends mostly on the environment, e.g., food availability, rainfall, light, temperature (Albrizio *et al*., 2013). The semen of dogs has special specifications where it is resistant to cold shock, at least above 70° F (Johnston *et al*., 2001). The researcher found that, in the dog, environmental changes appear to affect male gonadal physiology, the percentage of progressive motile spermatozoa is also dependent on environmental causes (Albrizio *et al*., 2013). On the other hand early diagnosis of canine testicular disorders may be useful before selecting a male dog for mating or artificial insemination (Domingos and Salomão, 2011). Some researchers study the effect of Iraqi season environment in several animals except German shepherd dogs (AL-Sahaf and Ibrahim, 2012; Abd and Ibrahim, 2014; Zaid, 2015; Ibrahim and Zaid, 2017a and Ibrahim and Zaid, 2017b). In the recent year large number of German shepherd dogs had been imported to Iraq to be use in security or as a pet animal or in breeding. So we have to examine where if these dogs are adjusted in the new environment and its reproductive performance under Iraqi conditions. So the aim of this study is to investigate some physiological properties of semen during different month of the year of the German shepherd dog reared in Iraq.

Materials and Methods

Experimental animals: Five (5) male dogs German shepherd breed were used in this experiment, age 2-4 years and weights 30-31 kg (electronic balance). For six months periods (October, November and December 2019) and (January, February and March 2020). All dogs from Ministry of Interior Resources / Al Muthanna Police Department are in good health and undergo continuous veterinary medical care and vaccinated for viral diseases. Water source are continuous, food include the granulated consisting of (protein 25%, fat15%, Cellulose 2.5% and several of vitamins, minerals). All dogs kept in one building, with a private cage for each dog of 3×4 m. Complete physical examination of all dogs before subjected to the experiment, including palpation of testicular consistency, measurement of testicular width, testicular atrophy or epididymal swelling for any heat, swelling, pain, or dermatitis associated with the testes and scrotum, And visual examination of the penis and prepuce.

Semen collection: The collecting staff consists of three members (the researcher and two assistants' police dog trainers), collecting was done by digital manipulation according to method described by (Linde-Forsberg, 1991). The semen collection for all dogs was done along the research period once weekly to ensure accuracy by collecting the full size. We started with a massage of the dog prepuce at the level of the bulbusglandis until developing partial erection, follow by the quick retraction of the prepuce and penile expose, the researcher used the right hand, and he was standing on the left side of the dog, with holding the dog's penis with the right hand and the collection container in the left hand. During pelvic thrusting, rigid vials kept at a distance from the penis, to avoid trauma. When pelvic movements are finished and the dog lifts its rear leg, a 180º backward rotation of the penis obtained and the erectile penis directed into the collection cone or the funnel. Some pressure may be applied with the thumb on the apex of the glans penis, at the level of the urethral process, to stimulate ejaculation. When a crystal clear fluid (prostatic fluid) begins to flow into the collection tube, we gently slide the collection cone off the penis. We watched it for semen to flow in the collection tube. After the collection, the penis is washed and made sure that it is not injured during work and that it returns to its normal place. The semen examination of each dog was done immediately after the collection and before proceeding to the collection of other dogs. The examination includes the physical properties (Volume, Mass motility and Individual motility) of the seminal fluid of the German shepherd dogs (GSD) breed**.**

Results

In the recent study, we studied the physical properties (volume, mass motility and individual motility) of the seminal fluid of the German shepherd dogs (GSD) breed during the six-month period (October, November and December 2019) and (January, February and March 2020).

Volume: There were a significant differences at the level ($P<0.05$) between the semen volume during January, February and March with the other months, where the higher volume was in January 33.2±8.55 ml and lower in December 32.5±9.35 ml as showed in (Table 1).

Mass motility: On a scale from 1-5, GSD recorded between November, January and February significant difference at the level ($P<0.05$) with October, December and March, The highest score was recorded in October 3.45±0.01 and the lowest in November and February 3.2±0.01 (Table 1).

Individual motility: The study recorded a significant difference at the level ($P<0.05$) between January and February with October and December. November and March did not record any

significant difference with the remaining months. The highest value was 88.25±1.35% in February and the lowest score of 87.25±1.38% in December (Table 1).

Table (1): Semen volume (ml), Mass motility (scale 1-5) and Individual movement (%) in German shepherd dog reared in Iraq during different months.

Months	Parameters		
	Volume	Mass motility	Individual motility
October	32.5±9.48 b	3.45±0.01 a	87.5±1.25 b
November	32.6±9.29 b	3.2±0.01 b	87.75±1.25 ab
December	32.5±9.35 b	3.4±0.01 a	87.25±1.38 b
January	33.2±8.55 a	3.2±0.02 b	88±1.37 a
February	33.1±8.57 a	3.2±0.01 b	88.25±1.35 a
March	33±9.01 a	3.4±0.02 a	87.75±1.51 ab

1. The number represents mean ± standard error.
2. The similar small letters represent no significant differences in the same column.
3. The different small letters represent significant differences at level ($P<0.05$) in the same column.

Table (2): Total Semen quality in German shepherd reared in Iraq.

Months	Parameters		
	Volume	Mass motility	Individual motility
Total	32.8±1.444482	3.308333±0.001792	87.75±0.216562

- The number represents mean ± standard error.

DISCUSSION

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The herein study indicated that there was a significant differences in semen volume during the studied months. These changes in semen volume between months of the study is agree with the results obtained by Strzezek *et al*. (2015) and Ibrahim and Zaid (2017a and 2017b) where they recorded changes in the volume of dog semen during different months (seasons), these differences is due to the changes in climate conditions and changes in the environment temperatures. Referring to Table (1), we note that the difference between the months is not much, as it ranged from 32.5±9.35 ml to 33.2±8.55 ml, which is a natural result of slight and gradual climatic changes during the months of the study. The total semen volume average during different months of the study was 32.8±1.444482 ml (Table 2), and this result is in agreement with Günzel-Apel (1994) and Johnston *et al*. (2001) with up to 30-40 ml, and within the adjacent mentioned by Johnston, (1991) from 1-30 cm^3. The result of our study had higher mean value from that reported by Shalini and Antoine (2018). Whereas specify the size 8.68±0.47 ml. And that this difference in size between studies may be due to environmental conditions (Zaid, 2015), or because of the long period of collection where the collection took place weekly and for a period of six months, with a total of (120) ejaculations, while Shalini and Antoine (2018) had only a total of 36 ejaculates from six GSD in their experiment. Otherwise one of the most important technical reasons may be related to gathering more than one dog per day causes which cause fatigue and relaxation in the pressure behind the bulbgland, which causes a lack and a change in the size of the third fraction that will leads to large changes in the overall size (Johnston, 1989). Or the animal's uncomfortable during collection as which said by Purswell *et al*. (2015). As well as to the breed differences and the degree of purity (Root Kustritz, 2007), as all the animals of our study is high-purity (data of the Ministry of Interior) in addition to very good environmental conditions and veterinary medical care, and it is worth noting that it connects the researcher and assistants with knowledge and affinity prior for dogs, which showed good results.

We noted the changes in mass motility in all months of study and this is coincide with the results obtained by Strzezek *et al*. (2015) and Ibrahim and Zaid (2017a and 2017b) and where they recorded changes in the mass motility of sperms during months (seasons). The total mass motility of different months was 3.308333±0.001792 (Table 2), and this is congruous to what was recorded by de Souza e*t al*. (1995) and Shalini and Antoine (2018). They registered alternately 3-4 and 3.55. This confirms that this breed is not affected by the atmosphere inside Iraq.

We noted the changes in individual motility in all months of study and this is what it went with Strzezek *et al*. (2015) and Ibrahim and Zaid (2017a and 2017b) and where they recorded changes in the individual motility of sperms during months (seasons). The total individual movement was 87.75±0.216562%, (Table 2). And this is fit to what was recorded by de Souza *et al*. (1995) and Shalini and Antoine (2018). They registered alternately 83.3±0.79% and the maximum value 90.0%. This confirms that this breed also not affected by the atmosphere inside Iraq.

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