

A Retrospective Study on Inter-Estrous Intervals and Annual Distribution of Estruses in Anatolian and German Shepherd Dogs

İbrahim TAŞAL¹ Ayhan BAŞTAN² Muhammet ALAN¹
Fetih GÜLYÜZ³ Engin KIRMIZI⁴

Summary

The objective of this study was to evaluate inter-estrous intervals and annual distribution of estrous periods of Anatolian and German Shepherd Dogs. During a period of 13 years estrous records of 118 Anatolian and 434 German Shepherd Dogs were reviewed. Average length of inter-estrous interval in Anatolian and German Shepherd bitches conceived were 241.6 ± 8.7 and 221.5 ± 4.9 days, respectively. In non-pregnant Anatolian and German Shepherd bitches inter-estrous intervals were 178 ± 10.8 and 169 ± 5.2 days, respectively.

The total number of estrous periods was the highest in April with a rate of 14.1 % and the lowest in November with a rate of 5.81 %. The difference in estrus occurrence between April and November was statistically significant ($P < 0.01$). If seasons are considered the number of estrous periods observed was the highest with a rate of 30.5 % in Spring and the lowest with a rate of 20.5 % in Autumn ($P < 0.01$). Estrous occurrence was not statistically different between Winter and Summer.

In conclusion, Anatolian and German Shepherd Dogs may exhibit estrus in any month of the year. The length of inter-estrous interval was longer in pregnant bitches compared to the non-pregnant females.

Key Words: Dog, Breeding season, Inter-estrous intervals.

Özet

Türk Çoban ve Alman Çoban Köpeklerinde Östrüs Periyotları Arası Süreler ve Östrüslerin Aylara Dağılımları Üzerine Bir Araştırma

Bu araştırma, Türk Çoban (TÇK, Anadolu, Sivas, Kangal) ve Alman Çoban (AÇK) köpeklerinde östrüs periyotları arası süreleri ve östrüslerin aylara dağılımlarını belirlemek amacıyla yapıldı. Bu amaçla 118 TÇK, 434 AÇK' nin 13 yıllık kayıtları değerlendirildi. Hayvanların gebe kaldıkları östrüs periyotları arasındaki sürelerin Türk Çoban Köpeklerinde 241.6 ± 8.7 , Alman Çoban Köpeklerinde 221.5 ± 4.9 gün olduğu saptandı. Her iki ırka ait köpeklerin gebe kalmadıkları östrüs periyotları arasındaki süreler ise sırasıyla, 178.2 ± 10.8 ve 169.0 ± 5.2 gün olarak belirlendi.

Östrüslerin %14.1 oranla en çok Nisan ayında ve %5.8 oranla en düşük Kasım ayında meydana geldiği izlendi. Nisan ve Kasım aylarında görülen östrüs oranları arasındaki farkın istatistik yönden önemli olduğu bulundu ($P < 0.01$). Mevsimler dikkate alındığında östrüslerin % 30.5 oranla en yüksek İlkbahar ve % 20.5 oranla en düşük Sonbahar aylarında şekillendiği görüldü. Bu iki mevsimde görülen östrüs oranları arasındaki farkın önemli olduğu ($P < 0.01$), Kış ve Yaz mevsimlerinde görülen östrüs oranlarının ise istatistik açıdan farklı olmadığı tespit edildi.

Sonuç olarak, Türk ve Alman Çoban Köpeklerinin yılın her ayında östrüs gösterebildikleri ve gebelik şekillenen östrüs periyotları arası sürelerin gebelik şekillenmeyenlere göre biraz daha uzun olduğu belirlenmiştir.

Anahtar Kelimeler: Köpek, Çiftleşme sezonu, Östrüsler arası süre.

Introduction

Bitch is considered a monestrous animal which has only one estrous cycle occurring in a year (1-5). An even distribution of estrous periods throughout the year in well-fed bitches was shown, although there is definite pattern of increased incidence of estrus from late winter through early spring (3,6,7). It was reported that (4), 38.1 % of 1561 estrous period observed in various breed of bitches was concentrated between February and May. It is assumed that day light length is very effective on the commencement and duration of the cyclic activity of ovaries. Estrous cycles are commenced by increased length of day light during spring and ceased by shortened day light length during autumn and winter (3,7,8). Average duration between estrous periods in the bitch is 200 ± 45 days (9-11). Durations shorter than four mounts and longer than eight mounts are generally regarded as abnormal (7,9). Johle and Anderson (1) expressed that inter-

¹Yüzüncü Yıl Üniversitesi Veteriner Fakültesi, Doğum ve Jinekoloji Anabilim Dalı, VAN.

²Ankara Üniversitesi Veteriner Fakültesi, Doğum ve Jinekoloji Anabilim Dalı, ANKARA.

³Yüzüncü Yıl Üniversitesi Veteriner Fakültesi, Dölerme ve Sun' i Tohumlama Anabilim Dalı, VAN.

⁴Askeri Veteriner Okulu ve Eğitim Merkez Komutanlığı, Gemlik-BURSA.

estrous interval may vary between 26 to 34 weeks.

This study was conducted to evaluate inter-estrous interval and annual distribution of estrous periods of Anatolian and German Shepherd Dogs.

Material and Methods

The material was consisted of 118 Anatolian Shepherd Dog (TSD) and 434 German Shepherd Dog (GSD) reared in the Military Research Institute in Bursa, Turkey. The age of the animals was between one to nine years. Estrus records of dog breeding during a period of thirteen years were evaluated. Totally 1719 estrous record was considered (369 periods in 118 Anatolian Shepherd Dog and 1350 periods in 434 German Shepherd Dog). Annual distribution of estrous periods and the length of inter-estrous interval in pregnant and non-pregnant bitches were determined and the data was analysed by means of Student's t test (11).

Results

Annual distribution of 1719 estrous periods observed in Anatolian and German shepherd bitches are illustrated in figure 1 and 2. Seasonal distribution of estrous periods in bitches are seen in figure 3 and figure 4.

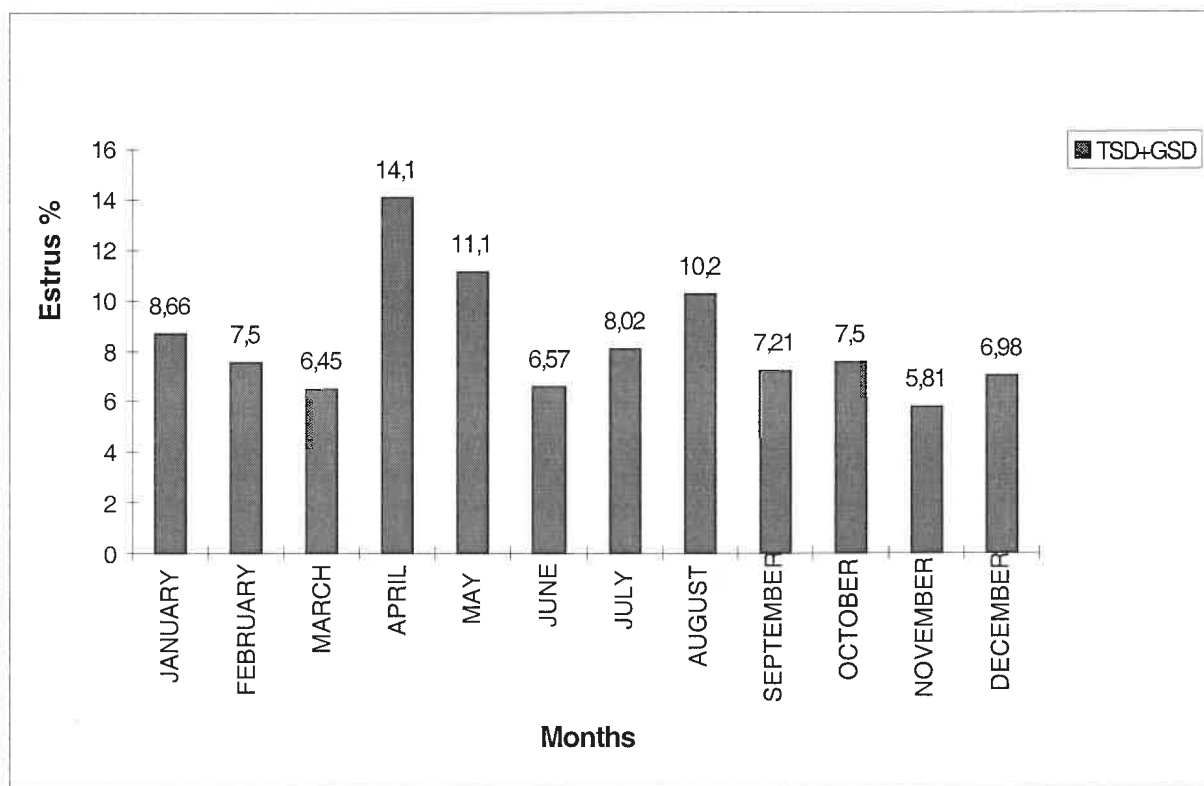


Figure 1: Annual distribution of 1719 estrous periods observed in Anatolian and German shepherd bitches.

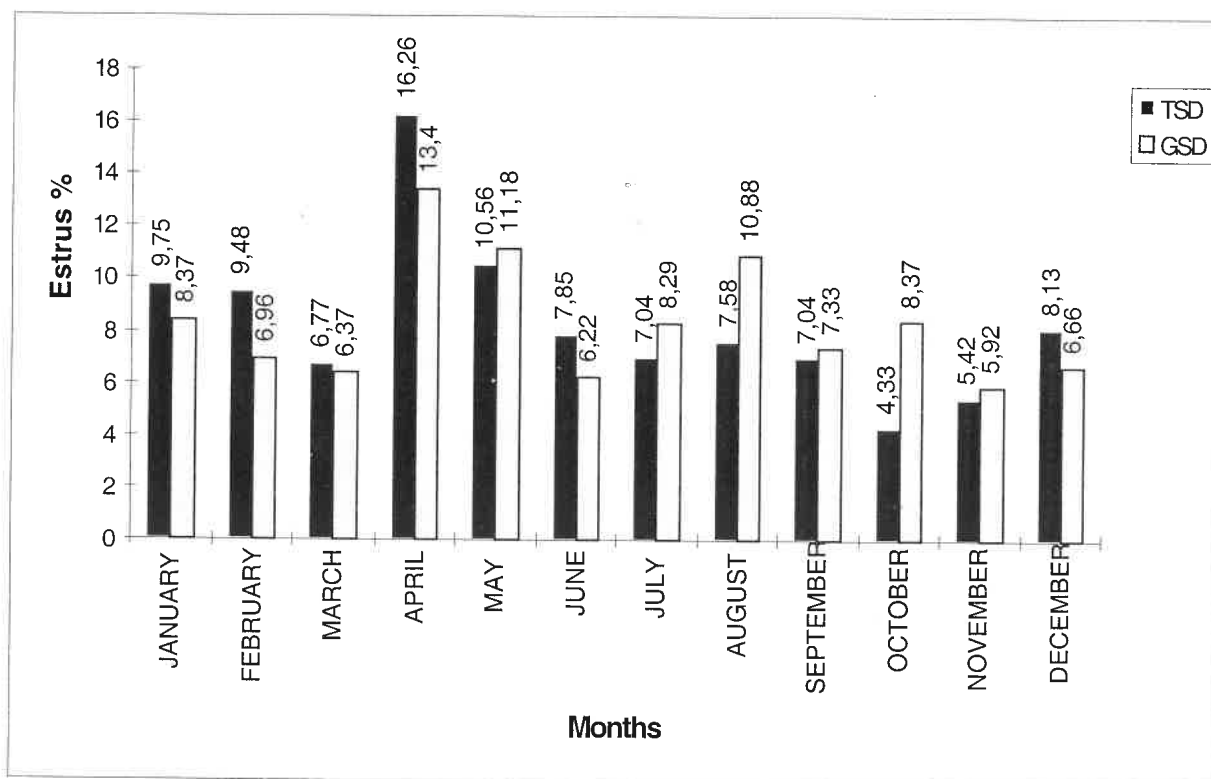


Figure 2: Annual distribution estrous periods observed in Anatolian and German shepherd dogs.

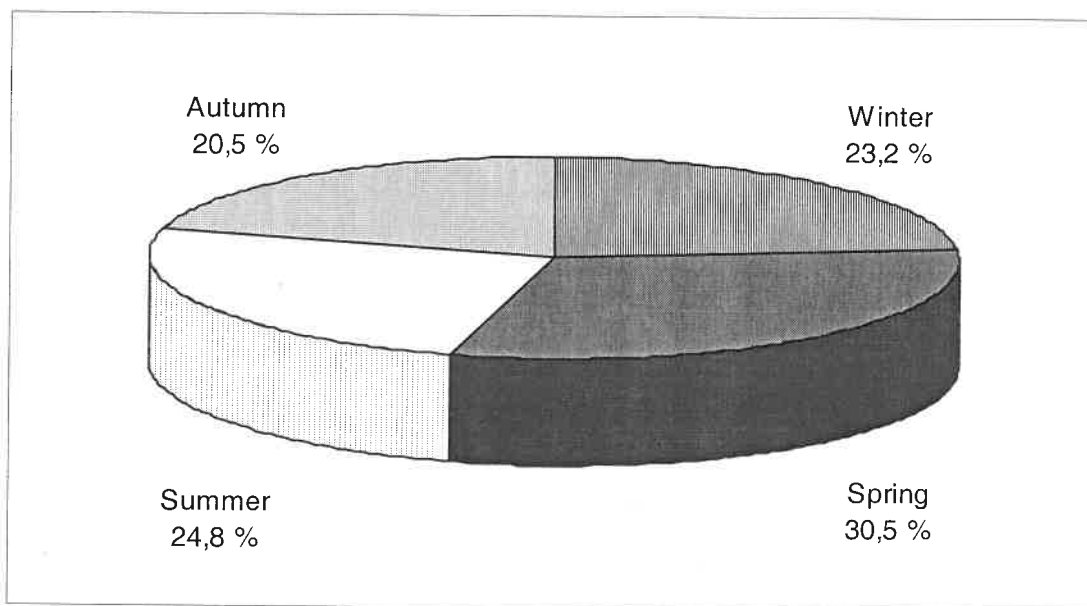


Figure 3: Seasonal distribution of estrous periods in bitches.

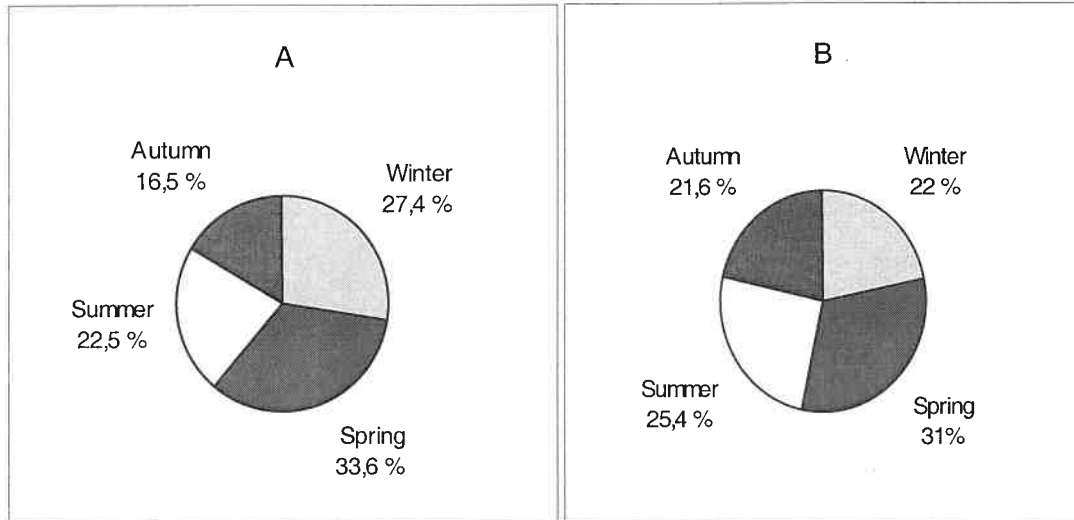


Figure 4: Seasonal distribution of estrous periods in Anatolian (A) and German shepherd (B) dogs.

Estrous number was the highest (n:241) with a rate of 14.1 % in April and the lowest (n: 100) with a rate of 5.81 % in November (Table 1). The difference in estrus occurrence in April and November was statistically significant ($P < 0.01$). If seasons are considered estrus occurrence was the highest (n:542) with a rate of 30.5 % in Spring (included March, April, May) and the lowest (n: 353) with a rate of 20.5 % in Autumn (included September, October, November) (Figure 3). The difference in estrus occurrence between Spring and Autumn was statistically significant ($P < 0.01$). However, there is no significant difference between the number of estrous periods detected in Winter (n: 398, 23.2 %) and Summer (n: 426, 24.8 %).

Inter-estrous interval in the bitches conceived were 241.6 ± 8.7 and 221.5 ± 4.9 days for Anatolian and German shepherd dog, respectively. Inter-estrous intervals in non-pregnant bitches were 178 ± 10.8 and 169 ± 5.2 days for Anatolian and German shepherd dog, respectively.

Discussion

Bitch is considered a monestrous animal displaying estrous activity concentrated around February (1,3,4,6,7,8). Contrarily, estrous activity was detected throughout the year, being the most in April in the present study. The difference between the present study and the previous papers (3,6,11) may be resulted from feeding, geographic and environmental differences.

Daylength is considered as an important factor effecting the ovarian functions. Estrous activity is induced by increased daylength and depressed by decreased daylength. Therefore, estrous activity are generally observed between February and May (3, 7, 8). Similarly to these reports, incidence of estrus was the highest in Spring (especially in April) and the lowest in Autumn (especially in November) in this study. This result emphasizes the importance of daylength on the commencement of estruses in bitches.

Çoyan (10), reported that bitches can exhibit estrus throughout the year without a prominent effect of seasons. Some the other researchers (3,7,9), also indicated estruses scattered to all year but generally to the late winter or Spring. Small breeds which have good care, nutrition and environment may exhibit estrus in any month in a year (11). Alike the others (3,7,9,10,11) estruses were determined in every month but more in some months than the others in this study (Table 1, Figure 1 and 2).

It is reported that intervals between estruses may be 200 ± 45 days (3,7,11) and it is not effected from pregnancy (1) but there may be difference among breeds (3). In this study intervals between estrous periods in which pregnancy was positive (241.6 days in TSD and 221.5 in GSD) is nearly as the same as the others (3,10,11). But as contrary to the literature (10), if pregnancy is negative this interval was shorter (178.2 days in TSD and 169.0 in GSD).

In conclusion, Anatolian and German Shepherd Dogs may exhibit estrus in any month of the year. In addition to the highest in Spring (especially in April) and the least in Autumn (especially in November).

The length of inter-estrous interval was longer in pregnant bitches compared to the non-pregnant females.

References

- 1- Jöhle W., Anderson A.C.: The Oestrus Cycle In The Dog: A Review, Clarification and Contribution. *Theriogenology* 7, 113-140, (1977).
- 2- Arthur G.H., Noakes D.E., Pearson H.: *Veterinary Reproduction and Obstetrics (Theriogenology)*, p 401-403, Bailliera Tindall, London, (1982).
- 3- Christiansen J.I.: *Reproduction in the Dog and Cat*. p 6 -13, Bailliera Tindall, London, (1984).
- 4- Christie D.W., Bell E.T.: Some observations on the seasonal incidence and frequency of oestrus in breeding bitches in Britain., *J. Small Anim. Pract.*, 12, 159-167, (1971).
- 5- Olson P.N., Nett T.M.: *Reproductive Endocrinology and Physiology of The Bitch*. DA Morrow (ed): *Current Therapy In Theriogenology*, p 453-456, W.B.Saunders Company, Philadelphia, (1986).
- 6- Jöhle W.: *The Sexual Cycle In Bitch*. p 617-624, Wolfgag Jöhle Associates Inc. Denville, (1987).
- 7- Felman E.C., Nelson R.W.: *Canine and Feline Endocrinology and Reproduction*, p 399-476, Philadelphia, W. B. Saunders Comp., (1987).
- 8- Hafez E.S.E.: *Reproduction in Farm Animals*. p 409-422, Lea Febiger, (1987)
- 9- Bouchard G., Youngquist R.S., Vaillancourt D., Krause G.F., Guay P., Paradis M.: Seasonality and Variability of the Interestrous Interval in the Bitch. *Theriogenology* 36,1, 41-50, (1991).
- 10- Çoyan K.: Evcil Hayvanlarda Seksüel Sikluslar. E. Alaçam (ed): *Evcil Hayvanlarda Reprodüksiyon Suni Tohumlama Doğum ve İnfertilite*, s 25-36, Konya, Dizgievi, (1994).
- 11- Dinç D.A.: Karnivorlarda İnfertilite. E. Alaçam (ed): *Evcil Hayvanlarda Reprodüksiyon Suni Tohumlama Doğum ve İnfertilite*. s 315-339, Konya, Dizgievi, (1994).
- 12- Kutsal A., Alpan O., Arpacık R.: İstatistik Uygulamalar. s 11-50, Bizim Büro Basımevi, Ankara, (1990).