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TURKISH KANGAL (KARABASH) SHEPHERD DOGS RAISED IN EUROPE

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ABSTRACT

This study was carried out to determine the body measurements of Turkish Kangal (Karabash) Shepherd Dogs raised in Belgium, France, Germany and Slovenia comparing them with certain other breeds from different countries. To this end, a total of 39 (18 male and 21 female) dogs were analyzed with the Minitab 15 statistical software program using ANOVA and Student's T-Test. Descriptive statistics were for live weight 50.5 ± 0.83 kg, height at shoulder 76.8 ± 0.50 cm, height at rump 76.1 ± 0.55 cm, body length 67.3 ± 0.63 cm, chest width 21.7 ± 0.26 cm, limb length 43.1 ± 0.47 cm, head length 29.4 ± 0.25 cm and ear length 12.7 ± 0.16 cm, respectively. The overall results of the study demonstrated that Turkish Kangal (Karabash) Shepherd Dogs raised in Belgium, France, Germany and Slovenia had a very close resemblance to dogs raised in the UK and USA, but that they were larger than the dogs raised in Turkey. In Europe the dogs reach mature body weight and size at around 2 years of age. The overall results of the current study revealed that the Turkish Kangal Dogs raised abroad were larger because of better life conditions.

Keywords: *Canis familiaris*, shepherd dog, morphological trait, body measurement.

INTRODUCTION

Although among scientists there is no complete agreement on where and when dogs (*Canis familiaris*) originated, the dog is the first domesticated animal in prehistoric times (Clutton-Brock 1995). DNA evidence suggests domestic dogs most likely diverged from wolves in different places at different times beginning as long as 135,000 years ago (Vila *et al*., 1997).

In many countries, livestock Guardian Dog (LGD) breeds have been used for centuries to protect livestock from predators (Clutton-Brock, 1995). In Turkey there are five native dog breeds, three of which are livestock Guardian dogs. The Turkish Kangal (Karabash) Shepherd, the Turkish Akbash Shepherd, the Kars (Caucasian) Shepherd, the Turkish Tazi (Sighthound), and the Catalburun (Fork-nose) Dogs are native dog breeds of Turkey. There are also local breeds of Bozova, Zagar or Dikkulak (Erect-ear), and Karaman Dogs (Yilmaz, 2006, 2007a).

Of the three livestock guardian dogs the Turkish Kangal (Karabash) Shepherd is raised, not only in most regions of Turkey, but also in countries from Canada to New Zealand, and from the Scandinavian countries to Namibia (Yilmaz, 2007b).

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The Kangal is a dog which has an intelligent and independent character. Ownership of a Kangal dog is a great responsibility. The feeding style of Kangals is also crucial. Apparently they can be fed on a diet consisting of purely vegetable food throughout their whole life. In the countryside they are fed only on 'yal' which is a mash prepared from barley flour by adding hot water. If they are fed on excess meat, their character may be spoiled and they may develop an aggressive attitude (Yilmaz, 2007b). Like all large dogs Kangal Dogs are very sensitive to sedatives, especially a drug called Acepromazine (ACP). This drug is used to calm a dog before an operation as a well-known pre-med. Several cases have been reported by Broadhead (Founder Member and Chairman of the Anatolian Karabash Dog Club of UK, breeder and KC Judge) of Kangal Dogs that have died during simple routine operations, not as the result of an overdose, but because of the normal correct amount (Broadhead, 2003). In Kangal Dogs many health problems have a genetic origin including Cryptorhisim, angulation deformations, undershot and overshot biting, fraenulum of the tongue, hereditary dermatitis, short tail and hip dysplasia (Tepeli, 2003).

A number of studies have been carried out on Turkish Kangal (Karabash) Shepherd Dogs as seen in Table 1. A PhD study was carried out by Kirmizi (1991) on 86 Turkish and 249 German Shepherd Dogs raised at Gemlik Military Veterinary School and Education Centre

Commandership (GAVOK) between 1982 and 1990. Yildiz *et al*. (1993) worked on head sizes of Turkish and German Shepherd Dogs raised at GAVOK. Ozbeyaz (1994) studied the body traits of 59 Kangal Dogs raised at GAVOK. Gonul (1996) carried out a study to determine body traits and training performance of 202 Turkish and 464 German Shepherd Dogs raised at GAVOK. Tepeli (1996) made a PhD study to determine body traits, growth rate and reproductive performance of 57 Turkish Kangal Shepherd Dogs raised at the Research Centre of Selcuk University Veterinary Faculty. Ozcan and Altınel (1997) worked on some morphological traits of 45 Kangal and 63 German Shepherd Dogs raised at GAVOK. Altuner (1998) determine reproductive performance, survival rate, growth and body traits of 32 adult and 167 juvenile Kangal Dogs raised at Ulas Agricultural Management Institution in Sivas province. Tepeli and Cetin (2003) carried out a study on head traits of Kangal and Akbash Shepherd Dogs. In this study 33 Kangal and 30 Akbash Dogs were measured for four head traits. Daskiran (2007) studied on 38 Kangal Dogs raised in Ulas State Farm. There are some Turkish Kangal (Karabash) Shepherd Dogs population raised in some European countries including in Belgium, France, Germany and Slovenia.

The aim of this study is to determine the body measurements of Turkish Kangal (Karabash) Shepherd Dogs in some European countries compared with Kangal Dogs in Turkey.

MATERIALS AND METHODS

Experimental animals

The Kangal dogs in the study were surveyed in January 2010 in the following locations: the city of Erkelenz, in the District of Heinsberg, in the State of North-Rhine-Westphalia of Germany (51º05'N; 06º19'E), in the town of Twistringen in the District of Dipeholz, in the State of Niedersachsen of Germany (48º00'N; 08º38'E), in the village of Velden in the District of Vils, in the State of Bavaria of Germany (51º05'N; 34º54'E), in the town of Kortessem-Vliermal in the District of Tongeren, in the Province of Limburg of Belgium (50º50'N; 05º26'E), in the village of Lunac in the District of Aveyron, in the Province of Midi-Pyrenees of France (44º15'N; 02º05'E), in the village of Tupalice in the Municipality of Preddvor, in the Region of Upper Carniola of Slovenia (46º17'N; 14º25'E) (Anon, 2014). A total of 39 dogs, 21 male and 18 female, were studied. The dogs were aged between 2 and 8 years, and divided into three age groups: 2-3 years, 4-5 years, and 6-8 years. In the first group there were 10 males and 7 females; in the second group there were 5 males and 9 females; and in the third group there were 3 males and 5 females. The ages of the dogs were determined from their owners.

Measurements

The sampled dogs were weighed for live weight (LW) with a portable spring scale. Linear measures such as height at shoulder (HS), height at rump (HR), body length

Table 1. Some morphologic traits on Turkish Kangal (Karabash) Shepherd dogs.

Beeds and source	LW (kg)	HS (cm)	HR (cm)	BL (cm)	CW (cm)	LL (cm)	HL (cm)	EL (cm)
Kirmizi (1991)	41(♂) 35.8(♀)	68(♂) 62.9(♀)		71.5(♂) 67.4(♀)				
Yildiz et al (1993)	45.5						28.9	
Ozbeyaz (1994)	40.5(♂) 32.4(♀)	69.1(♂) 62.4(♀)	71(♂) 64(♀)				26.8(♂) 28.4(♀)	13.1(♂) 12.7(♀)
Gonul (1996)		63		71.2	21.1			
Tepeli (1996)		68.9	70.4	63.8			27.8	12.5
Ozcan and Altınel (1997)								
Altuner (1998)								
Tepeli and Cetin (2003)								
Daskiran (2007)	43.4(♂) 34.2(♀)	71.7(♂) 65.2(♀)	72.1(♂) 64.5(♀)	71.1(♂) 66.2(♀)		41.9(♂) 39.4(♀)	24.7(♂) 23.8(♀)	13.1(♂) 12.7(♀)
(www.akdc.com.uk 2011)	50-65(♂) 40-55(♀)	74-81(♂) 71-79(♀)						
(www.ukcdogs.com 2011)	50-65(♂) 40-55(♀)	74-81(♂, 71-79(♀)						

LW=Live weight, HS=Height at shoulder, HR=Height at rump, BL=Body length, CW=Chest width, LL=Limb length, HL=Head length and EL=Ear length.

Table 2. Descriptive statistics and comparison results of the phenotypic traits of Turkish Kangal (Karabash) Shepherd Dogs for different sexes.

Traits	Overall (n=39)	Male (n=18)	Female (n=21)
	$\bar{X} \pm S_{\bar{X}}$	$\bar{X} \pm S_{\bar{X}}$	$\bar{X} \pm S_{\bar{X}}$
LW (kg)	50.5±0.83	53.2B±1.10	48.2A±0.89
HS (cm)	76.8±0.50	78.3B±0.79	75.6A±0.52
HR (cm)	76.1±0.55	77.3b±0.91	75.0a±0.60
BL (cm)	67.3±0.63	68.8b±0.93	66.0a±0.75
CW (cm)	21.7±0.26	22.3a±0.34	21.3a±0.36
LL (cm)	43.1±0.47	43.8a±0.76	42.4a±0.56
HL (cm)	29.4±0.25	30.0B±0.26	28.8A±0.38
EL (cm)	12.7±0.16	12.9a±0.25	12.5a±0.22

a, b = P<0.05; A, B = P<0.01
* There were no significant differences between means showed by the same letters of the alphabet in the same row and factor group.
LW=Live weight, HS=Height at shoulder, HR=Height at rump, BL=Body length, CW=Chest width, LL=Limb length, HL=Head length and EL=Ear length.

Table 3. Phenotypical correlation coefficients (r) between body measurements in Turkish Kangal (Karabash) Shepherd dogs.

Traits	LW	HS	HR	BL	CW	LL	HL
HS	0.83**						
HR	0.82**	0.97**					
BL	0.62**	0.76**	0.73**				
CW	0.29	0.41**	0.38*	0.65**			
LL	0.43**	0.53**	0.51**	0.20	0.68		
HL	0.55**	0.41**	0.33*	0.32	0.03	0.33*	
EL	0.45**	0.38*	0.41**	0.29	0.19	0.18	0.43**

*P<0.05, **P<0.01.
LW=Live weight, HS=Height at shoulder, HR=Height at rump, BL=Body length, CW=Chest width, LL=Limb length, HL=Head length and EL=Ear length.

(BL), chest width (CW) and limb length (LL) were measured using a measuring stick calibrated in centimetres. Other linear measures such as head length (HL), and ear length (EL) were measured using a graduated plastic tape (Yilmaz, 2007a).

Dogs were provided to stand on a hard, level surface. The traits measured were as follow:
- HS: Vertical distance between the highest point of shoulders and level surface.
- HR: Vertical distance between the highest point of rump (*Tuber sacrale*) and level surface.
- BL: Horizontal distance between *Caput humeri* and *Tuber ischii*.
- CW: Horizontal distance on chest behind scapulas.
- LL: Vertical distance between sternum and level surface.
- HL: Level distance between *Crista occipitalis* and *Os incisivum.*
- EL: Level distance between base and point of inner side of ears (Yilmaz, 2007[a]).

STATISTICAL ANALYSIS

Data were analyzed with the Minitab 15 statistical software program. Descriptive statistics for body dimensions were analyzed using ANOVA and Student's T-Test that also determined the impact of sex, country and age group on the response variables of LW, HS, HR, BL, CW, LL, HL, and EL (Anonim, 2011).

RESULTS

Based our data, between male and female dogs there were significant differences for morphological traits of LW, HS (P<0.01) and HR, BL, HL (P<0.05) see table 2. For all results, significant or not, male dogs yielded higher values than females. Country and age effect were not significant for all morphological traits.

The phenotypic correlation values displayed in the table 3 show that most of the observed traits are affected by selected factors. The highest values were found between

HS and HR (r = 0.97) (P<0.01). Other high values were found between LW and HS (r = 0.83), and LW and HR (r = 0.82) (P<0.01). The correlations of HS-BL, and HR-BL also yielded higher values those than r = 0.70 (P<0.01). The lowest value (r = 0.33) was found between BL-HL and LL-HL (P<0.05). Other low correlation values were found between HS-EL (r = 0.41), and HR-CW (r = 0.41) (P<0.05). There were no negative correlations between all other traits, as seen in table 3.

DISCUSSION

According to the results obtained in this research, Turkish Kangal (Karabash) Dogs are large-size livestock guardian dogs. According to the UK and USA Kennel Club live weights are 50-65 kg for males and 40-55 kg for females. These values agreed with the values of this study. The values reported by Kirmizi (1991), Yildiz et al. (1993), Ozbeyaz (1994), and Daskiran (2007) were lower than the values found in this study. It can be concluded that Kangal Dogs raised abroad are heavier than dogs raised in Turkey. This can be explained by the better feeding opportunity of dogs abroad.

For the trait of HS there was the same situation. The values of this study agreed with the UK and USA Kennel Club values for either sex. The values reported by Kirmizi (1991), Ozbeyaz (1994), Gonul (1996), Tepeli (1996) and Daskiran (2007) were lower than the values of the UK and USA Kennel Club values. It can be concluded that for the trait of HS, dogs raised abroad are taller than dogs raised in Turkey which can also be related to better feeding.

Only three researchers, Ozbeyaz (1994), Gonul (1996), Tepeli (1996) and Daskiran (2007) reported HR values which were lower than the values of this study. As seen in table 4 the highest phenotypical correlation coefficients (r) are between HS and HR (r = 0.97) (P<0.01). Although there was no data about HR reported by the UK and USA Kennel Clubs, it can be concluded that dogs raised abroad have similar HR values. So it can be concluded that dogs raised abroad are heavier and taller than dogs raised in Turkey.

Some other studies, Kirmizi (1991), Gonul (1996), Tepeli (1996) and Daskiran (2007) reported values for the trait of BL. Kirmizi (1991) and Gonul (1996) reported higher values than those in this study, while Tepeli (1996) reported lower values than in this study for either sex as seen in table 2 and 3. The values in this study agreed with Daskiran (2007) for females but they were lower than the values of Daskiran (2007) for males.

The result of CW agreed with the result reported by Gonul (1996) which was the sole result for CW. For the trait of LL there was only one reported results by Daskiran (2007) which was lower than this study's results for both sexes.

Yildiz et al. (1993), Ozbeyaz (1994), Tepeli (1996) and Daskiran (2007) reported results for HL. Results of present study agreed with the results of Yildiz et al. (1993) for overall and Ozbeyaz (1994) for females, but were higher than the results of Tepeli (1996) and Daskiran (2007) for overall and Ozbeyaz (1994) for males as seen in tables 2 and 3. Finally Ozbeyaz (1994), Tepeli (1996) and Daskiran (2007) reported results for the trait of EL and all agreed with this study's results as seen in tables 2 and 3.

CONCLUSION

The overall results of the current study demonstrate that Turkish Kangal (Karabash) Shepherd Dogs raised in Belgium, France, Germany and Slovenia have a very close resemblance to the dogs raised in the UK and USA. It can be concluded that the Turkish Kangal (Karabash) Shepherd Dog raised abroad is larger than the dogs raised in Turkey. In Europe the dogs grow up to 2 years of age after which there is only minor growth. This suggests that the Turkish Kangal (Karabash) Shepherd Dog reaches mature body weight and size at around 2 years of age. The overall results of the current study revealed that the Turkish Kangal Dogs abroad were larger because of better life conditions.

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