Some Descriptive Characteristics Concerning Craniometric Measurement in Kangal Dog

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Abstract: In this study, a total of 38 adult female and male Kangal dogs were used for craniometric measurements. Average facial width was found 13.09 ± 0.202 mm for females, 14.84 ± 0.197 mm for males (p<0.01). Average facial and skull index were found as 122.22 ± 3.709 mm, 55.213 ± 0.984 mm for females, 134.26 ± 3.470 mm and 60.14 ± 1.080 mm for males, respectively. Body weights for females and males were 34.27 ± 0.944 kg and 43.43 ± 1.330 kg. The ratio of skull length to facial width was 1.0:0.55 for females, 1.0:0.60 for males. In conclusion, Kangal dogs can be considered in dolichocephalic group, according to the value of skull length/ facial width ratio.

Key words: Kangal dog, Craniometric measurement, descriptive characteristics

INTRODUCTION

Sheep rearing concerns the largest part of animal production sector in Turkey, due to 26 millions of sheep[1]. Sheep flocks are usually kept out-door in pasture based feeding during grazing period. In many sheep breeding areas, the basic problem for safety of flocks are peredators. It is possible to protect sheep herd against predators about up to 50-80% of safety in grazing areas[2].

The Kangal dog is one of the famous Anatolian sheep dog with its size, courage and mastiff-like character.

The dogs being raised from Kangal district of Sivas province in Central Anatolia have typical and most appreciable characteristics type of Kangal dog.

The earliest apparition of Kangal like sheep dogs was at 2000-1800 before Christ, during Hittite civilization in Anatolia[3]. It was mentioned of a dog strain which was very similar to Kangal dog of today, in ancient Tibetan relieves from the period 4000 before Christ[4]. It is thought to be that ancient settlers migrated from Asia, might have brought their sheep and hunt dogs to Anatolia. Especially, Central Asian tribes migrated in 1000 after Christ, might have played a particular role in apparition of different sheep dogs in Anatolia.

The objective of this study is to investigate some skull measurement characteristics in Kangal sheep dogs.

MATERIALS AND METHODS

Material: In this study, a total of 22 female and 16 male Kangal dogs were used. The dogs were1-5 years-old and bred in Ulas State Farm, situated in Sivas province, Turkey. Dogs were fed daily with cereal-based mixture and weekly slaughtering houses remainders.

Method: Craniometric measurements were taken by using the method described by Stockard[5]. Craniometric measurements and indices were obtained as fallows (Fig. 1 and 2):

Skull length: Rostral point of sutura interinciciva-protuberantia occipitalis externa

Maximum zygomatic (facial) width: Left arcus zygomaticus-right arcus zygomaticus

Facial lenght: Frontal midpoint-rostral point of sutura interinciciva

Skull index: Maximum zygomatic width x 100/Skull length

Facial index: Maximum zygomatic width x 100/Facial length

Data were analysed by Minitab package programme[6].

RESULTS

Average skull measurements of female and male Kangal dogs are shown in Table 1. Average skull measurement values, such as facial and skull length and skull indices do not vary significantly according to gender of adult dogs, except for facial width which was found

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Table 1: Average skull measurements in female and male Kangal dogs $(\overline{X}+S\overline{x})$

Characteristics	Female (n:22)	Male (n:16)
Facial lenght(cm)	10.841±0.243	11.156±0.298
Facial width(cm)	13.091±0.202	14.844±0.197*
Skull lenght(cm)	23.773±0.308	24.750±0.374
Facial index	122.220±3.709	134.260±3.470
Skull index	55.213±0.984	60.140±1.080
Body weight(kg)	34.227±0.944	43.410±1.330
General skull index	57.288±0.823	
General facial index	127.290±2.740	

P<0.01

Table 2. Average skull measurements by ages in Kangal dogs $(\overline{X}\pm S\overline{x})$

|	Age groups				
	1	2	3	4	5
Characteristics	n:4	n:13	n:5	n:6	n:10
Facial lenght(cm)	10.625±0.239	11.077±0.383	10.900±0.400	10.667±0.357	11.200±0.436
Facial width(cm)	14.000±0.408	13.346±0.402	13.900±0.557	13.583±0.327	14.500±0.365
Skull lenght(cm)	23.250±0.479	24.038±0.369	24.200±1.020	23.833±0.477	24.950±0.519
Facial index	132.090±6.030	122.100±5.510	127.900±5.050	128.090±5.290	131.330±6.170
Skull index	60.240±1.670	55.620±1.720	57.500±1.110	57.020±1.040	58.330±1.880
Body weight(kg)	38.250±2.690	35.770±1.850	37.800±3.580	36.170±1.220	42.350±2.160
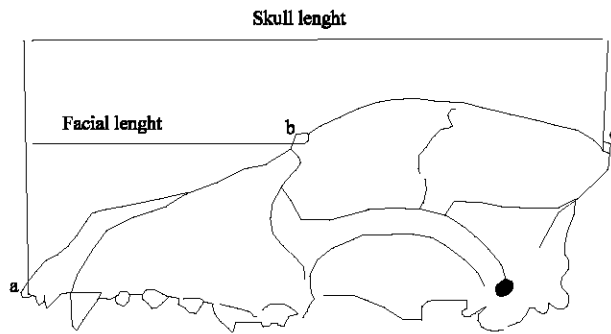
Fig. 1. Lateral view of Kangal dog skull and measurement points
a: Rostral point of sutura interinciciva
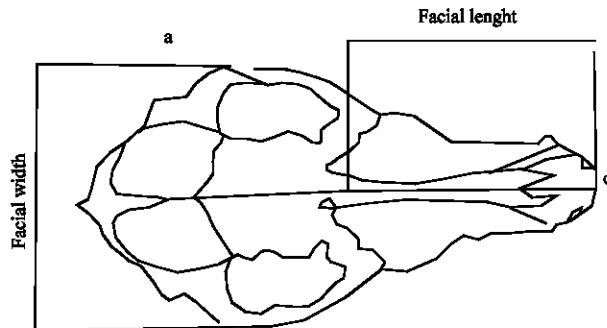b: Frontal midpoint
c: Protuberantia occipitalis externa

Fig. 2: Dorsal view of Kangal dog skull and measurement points

13.09 ± 0,202 mm for females, 14.84 ± 0.197 mm for males (p<0.01) respectively. Average facial and skull index were found as 122,22±3,709 mm and 55.213±0,984 mm for females, 134.26±3.470 mm and 60.14±1.080 mm for males respectively. Average body weights for females and males were found as 34.27±0.944 kg and 43.41±1.330 kg, respectively.

The distribution of average skull measurements by ages, are presented in Table 2. These values do not vary significantly between age groups in Kangal dog.

DISCUSSION

In a study concerning skull typology, Kangal dogs were considered mesaticephalic, like Germen Shepherd dogs[7]. In same study, average facial and skull lengths in Kangal dogs of 1, 2 and 3 years-old were found as 13.31 and 26.38, 31.34 and 26.61, 13.45 and 28.99 cm, respectively. Average values of facial length were found lower in our study. Onar et al.,[8] have obtained average values in macerated adult Kangal skulls as follows: Skull length, 25.87±13.375 cm; facial length, 13.00±5.404 cm; skull index, 50.29±1.033 and facial index 99.62±3.891. In our study, the ratio of skull length to facial width was 1.0:0.55 for females, 1.0: 0.60 for male Kangal dogs. Zietzschmann[9] had reported that dogs described in dolichocephalic group have the ratio of skull length to facial width as 1.0:0.60-0.65. Onur et al.,[8] have found this ratio as 1.0: 0.50. Same authors have considered Kangal dog as dolichocephalic race, according to the values of skull measurement which were found noticeably higher than these obtained from mesocephalic breeds. Therefore, the values obtained from our study were very close to the other researchers findings. The facial and skull indices in Kangal dogs of 1, 2 and 3 years-old were found 92.8 and 46.8, 96.5 and 48.4, 108.7 and 50.4, respectively[2]. The values of facial index were found higher in the study

conducted by Yildiz *et al.*,[2], compared to our findings. Generally, a higher value of facial length was not appreciated by Kangal dog breeders, because of a harmony between facial and skull length is preferred in dogs. In practice, the preference of Kangal breeders is as 1/3 for facial/skull length ratio in Kangal dogs.

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