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# ZOOTECHNICAL ANALYSIS OF TWO KANGAL POPULATIONS TARGETED AT STANDARDIZATION OF KANGAL AS A TURKISH DOG BREED

In order to standardize Kangal in a definite kynological-zootechnical way as an indigenous Turkish breed, Kennel club of Turkey began serious work in 2008. First expedition in region near the town of Sivas was organized in May that year.

In order to determine adequate exterior parameters that are typical for the breed, all selected dogs were measured and a value for 23 predefined exterior parameters was taken. Beside this, saliva sample was sampled from buccal mucous membrane for genetic research and hair samples were obtained in order to determine hair structure. 85 dogs were chosen and measured in the field, 51 male and 34 bitches.

In order to make discussion of exterior parameters more precise, another analysis was made in 2010, this time in vicinity of Ancara. It was conducted along the same principles and 26 males and 15 bitches were measured, making a total of 41 measured dogs in the population. In total, 126 dogs were measured, which makes the sample statistically acceptable.

Zootechnical data analysis in both populations makes for overview and analysis of male and bitch samples, while sublimate results are presented and analyzedt at the end. Ults are represented inform of tables and two methods were used for graphical representation of data in order to make data more presentable and acceptable for the reader.

Analysis and presentation of obtained results was done according to scientific methodology used in zootechnics. However, results of genetic analysis were still unavailable at the time when this paper was written, as were the results of hair analysis. These results will be the subject of some future paper.

It is necessary to point out that, during al measuring and data sampling procedures, representatives of Kennel club of Turkey were present, while mr. Hasan Cansever, KIF president, was present at all times.

# POPULATION „SIVAS" AND „ANKARA" COLLECTIVILY

*Height at withers*

A sample of 126 dogs in total was observed in both populations. Minimal height at withers was found in just one dog and was 61,5 cm. (0,79%), and next smallest height of 62,00 cm was also measured at just one dog. When maximal height at withers is observed, we must note that maximal values were found in just one dog. So, a maximum of 84,00 cm was recorded in just one dog (0,79%). Except the value of 77,5 cm, which was recorded in five cases, all other values to the maximal value were observed in individual cases. This means that upper limit for height at withers can be limited to 78,00 cm.

Similar statement can be made if we discuss minimal value of height at withers. Values below 63,00 cm should not be included in the interval predicted by the standard.
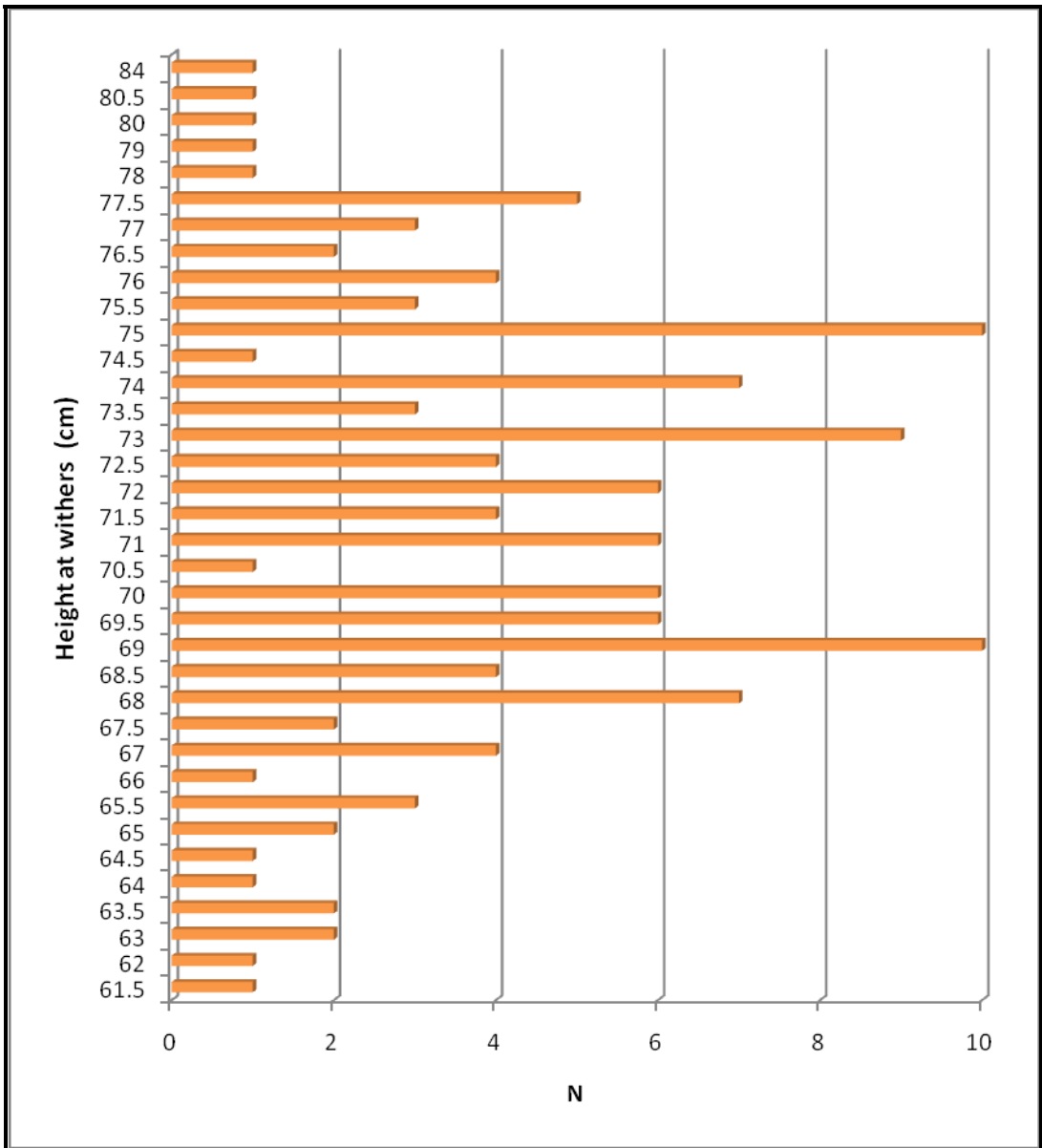
When observing frequency of certain values, we can observe that most dogs had height at withers in range from 65,00 cm to 77,5 cm.
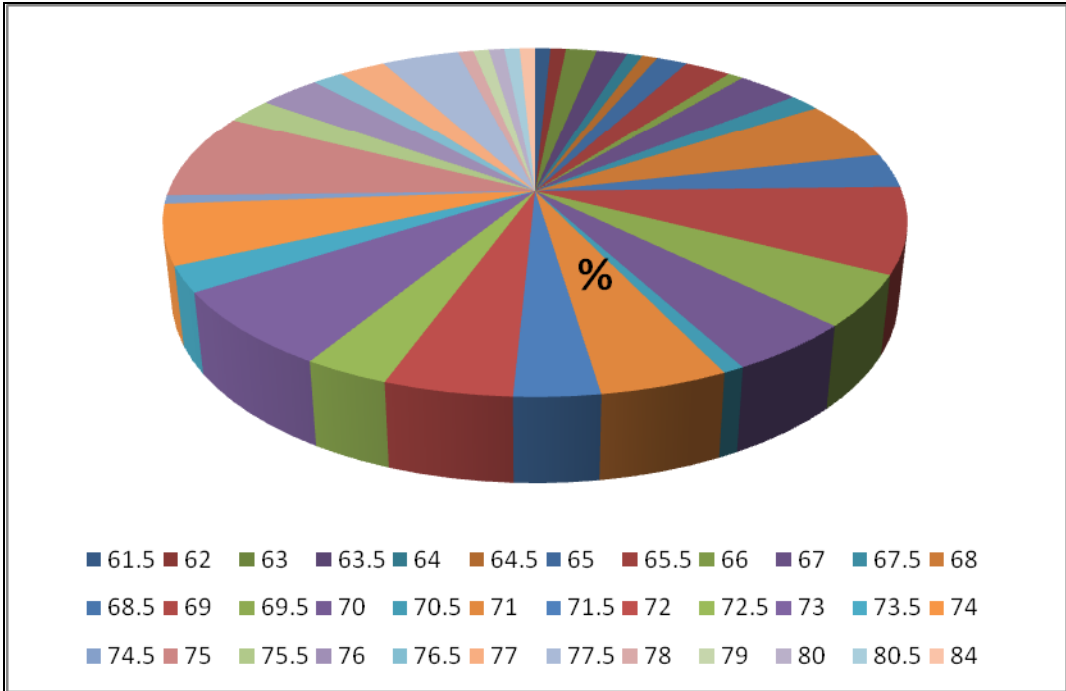
With regard to measures obtained in the field, mean height at withers is 71,47 cm. Of course, this value will be eliminated if we exclude maximal and minimal found value and leave range from 63,00 cm to 78,00 cm.

*Height at withers (n=126)*

| No | Height at withers (cm) | n | % |
|---|---|---|---|
| 1. | 61.5 | 1 | 0.79 |
| 2. | 62 | 1 | 0.79 |
| 3. | 63 | 2 | 1.59 |
| 4. | 63.5 | 2 | 1.59 |
| 5. | 64 | 1 | 0.79 |
| 6. | 64.5 | 1 | 0.79 |
| 7. | 65 | 2 | 1.59 |
| 8. | 65.5 | 3 | 2.38 |
| 9. | 66 | 1 | 0.79 |
| 10. | 67 | 4 | 3.17 |
| 11. | 67.5 | 2 | 1.59 |

| | | | |
|---|---|---|---|
| 12. | 68 | 7 | 5.56 |
| 13. | 68.5 | 4 | 3.17 |
| 14. | 69 | 10 | 7.94 |
| 15. | 69.5 | 6 | 4.76 |
| 16. | 70 | 6 | 4.76 |
| 17. | 70.5 | 1 | 0.79 |
| 18. | 71 | 6 | 4.76 |
| 19. | 71.5 | 4 | 3.17 |
| 20. | 72 | 6 | 4.76 |
| 21. | 72.5 | 4 | 3.17 |
| 22. | 73 | 9 | 7.14 |
| 23. | 73.5 | 3 | 2.38 |
| 24. | 74 | 7 | 5.56 |
| 25. | 74.5 | 1 | 0.79 |
| 26. | 75 | 10 | 7.94 |
| 27. | 75.5 | 3 | 2.38 |
| 28. | 76 | 4 | 3.17 |
| 29. | 76.5 | 2 | 1.59 |
| 30. | 77 | 3 | 2.38 |
| 31. | 77.5 | 5 | 3.97 |
| 32. | 78 | 1 | 0.79 |
| 33. | 79 | 1 | 0.79 |
| 34. | 80 | 1 | 0.79 |
| 35. | 80.5 | 1 | 0.79 |
| 36. | 84 | 1 | 0.79 |
| **Total** | | 126 | 100.00 |

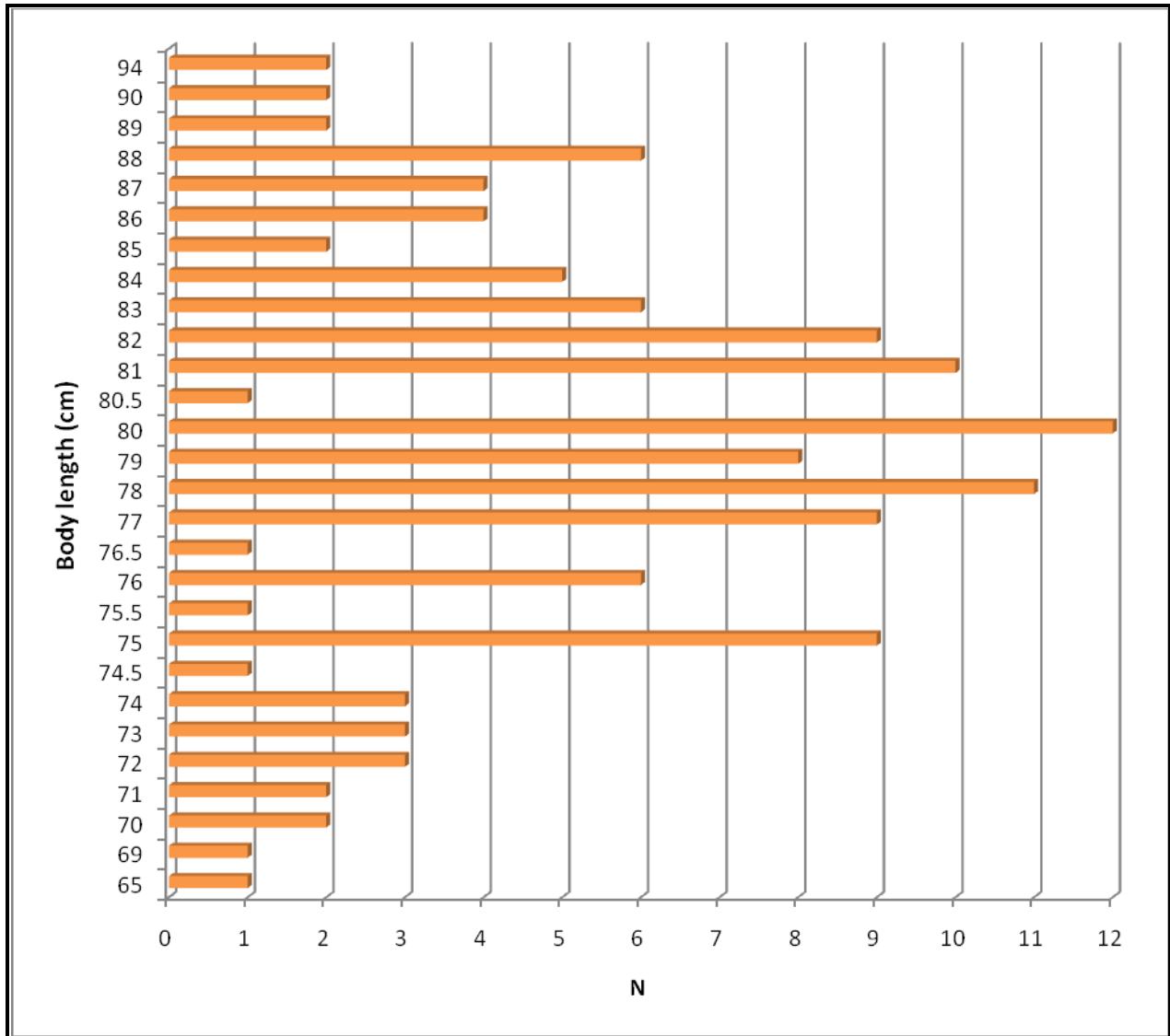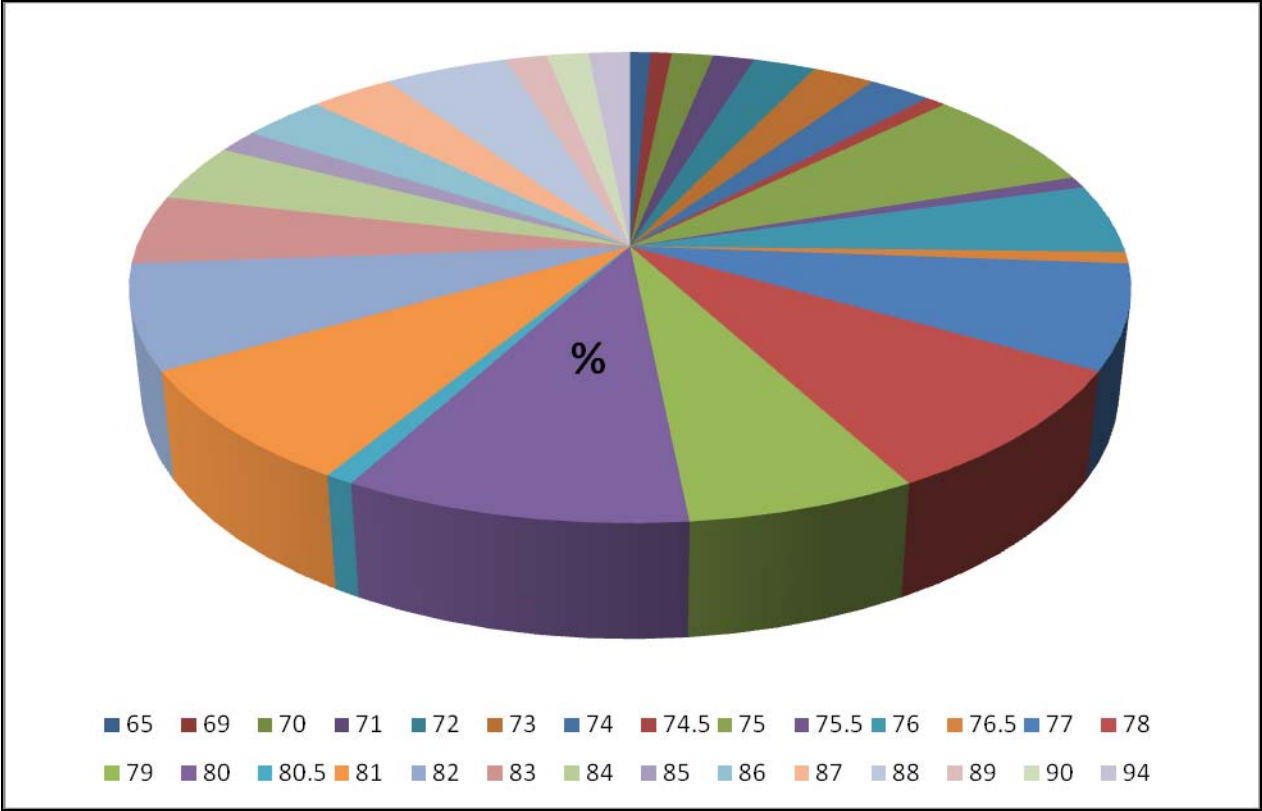| Minimal value (cm) | Mean value (cm) | Maximum value (cm) |
|---|---|---|
| 61,50 | 71,47 | 84,00 |

*Body length*

Minimal value was 65,00 cm with maximal value of 94,00 cm. Mean value was 79,80 cm. Results of this research indicate that body of Kangal is of an elongated shape.

*Body length (n=126)*

| No | Body length (cm) | n | % |
|----|------------------|----|------|
| 1. | 65 | 1 | 0.79 |
| 2. | 69 | 1 | 0.79 |
| 3. | 70 | 2 | 1.59 |
| 4. | 71 | 2 | 1.59 |
| 5. | 72 | 3 | 2.38 |
| 6. | 73 | 3 | 2.38 |
| 7. | 74 | 3 | 2.38 |
| 8. | 74.5 | 1 | 0.79 |
| 9. | 75 | 9 | 7.14 |
| 10. | 75.5 | 1 | 0.79 |
| 11. | 76 | 6 | 4.76 |
| 12. | 76.5 | 1 | 0.79 |
| 13. | 77 | 9 | 7.14 |
| 14. | 78 | 11 | 8.73 |
| 15. | 79 | 8 | 6.35 |
| 16. | 80 | 12 | 9.52 |
| 17. | 80.5 | 1 | 0.79 |
| 18. | 81 | 10 | 7.94 |
| 19. | 82 | 9 | 7.14 |
| 20. | 83 | 6 | 4.76 |
| 21. | 84 | 5 | 3.97 |
| 22. | 85 | 2 | 1.59 |
| 23. | 86 | 4 | 3.17 |
| 24. | 87 | 4 | 3.17 |
| 25. | 88 | 6 | 4.76 |

| | | | |
|---|---|---|---|
| 26. | 89 | 2 | 1.59 |
| 27. | 90 | 2 | 1.59 |
| 28. | 94 | 2 | 1.59 |
| **Total** | | 126 | 100.00 |

Legend: 65 · 69 · 70 · 71 · 72 · 73 · 74 · 74.5 · 75 · 75.5 · 76 · 76.5 · 77 · 78 · 79 · 80 · 80.5 · 81 · 82 · 83 · 84 · 85 · 86 · 87 · 88 · 89 · 90 · 94

| Minimal value (cm) | Mean value (cm) | Maximum value (cm) |
|---|---|---|
| 69,00 | 79,80 | 94,00 |

*Head length*

Shortest measured head was 25,00 cm and longest was 33,00 cm. Mean value is 28,83 cm.

*Head length (n=126)*

| No | Head length (cm) | n | % |
|---|---|---|---|
| 1. | 25 | 3 | 2.38 |
| 2. | 26 | 9 | 7.14 |
| 3. | 26.5 | 1 | 0.79 |
| 4. | 27 | 13 | 10.32 |
| 5. | 27.5 | 2 | 1.59 |
| 6. | 28 | 24 | 19.05 |
| 7. | 28.5 | 1 | 0.79 |
| 8. | 29 | 33 | 26.19 |
| 9. | 30 | 19 | 15.08 |
| 10. | 31 | 10 | 7.94 |
| 11. | 32 | 9 | 7.14 |
| 12. | 33 | 2 | 1.59 |
| **Total** | | 126 | 100.00 |

| Minimal value (cm) | Mean value (cm) | Maximum value (cm) |
|---|---|---|
| 25,00 | 28,83 | 33,00 |
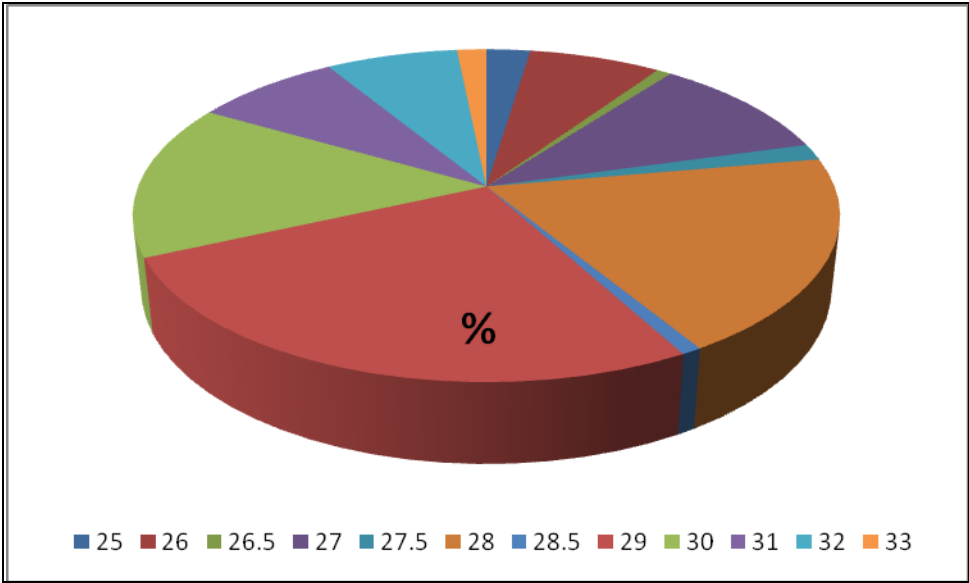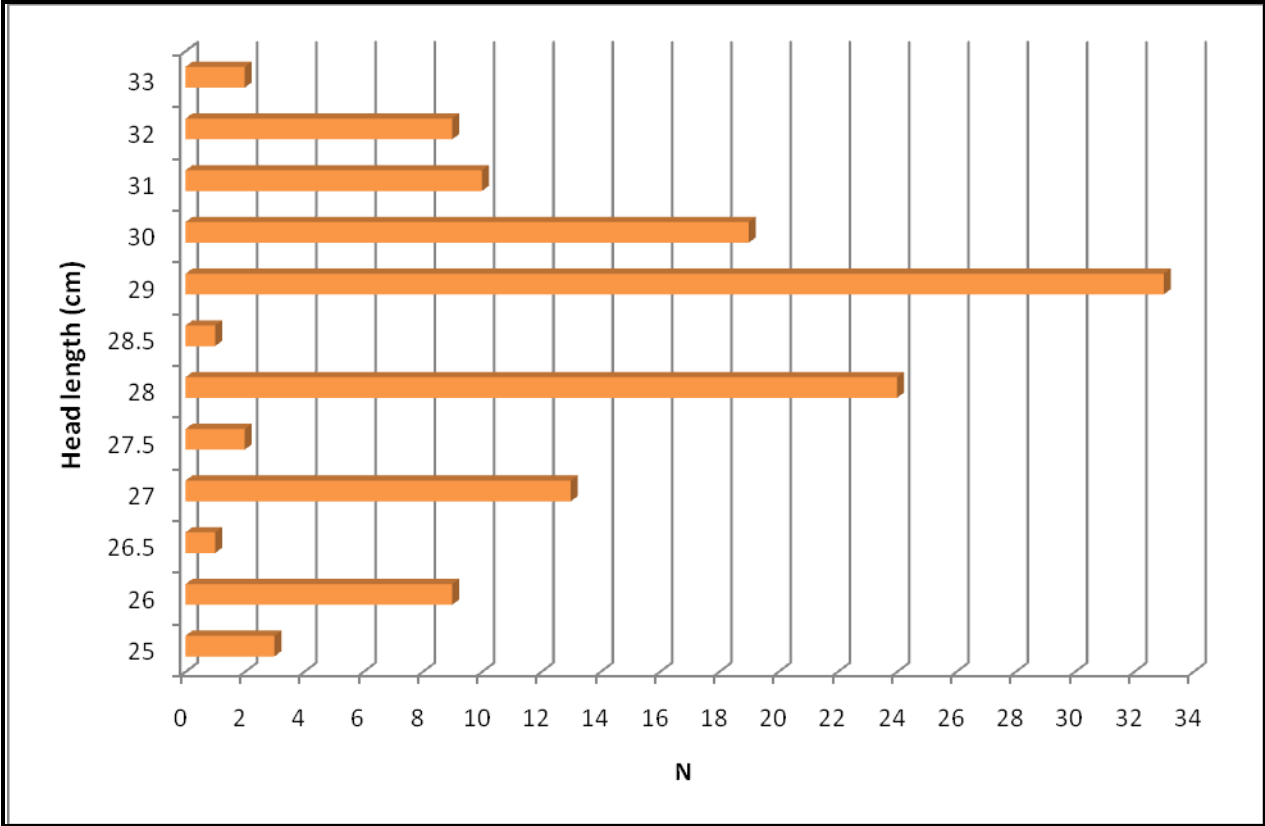
*Body indexes*

- back height is 4-5% lower than height at withers

- dogs are high at rear for 1%, meaning that back are that much higher than the withers.

- base of the tail is 6-8% lower than height at withers.

- ankle height is 22-35% height at withers

- elbow height constitutes 53-54% of height at withers. Elbow is located 3-4% above the mean height at withers.

- body is of rectangular shape and is 11-12% longer than height at withers.

- chest depth is 33-44% of height at withers

- chest width is 27-37% of height at withers

- chest circumference is 12-13% greater than height at withers

- Kangal has powerful bones and range of boniness is very narrow, between 21 and 22

- pelvis length is 29-34% of height at withers

- pelvis width is 9-19% of height at withers

- seat bone width is 8-17% of height at withers

- head length is 39-40% of height at withers. This parameter shows that head length is basically a constant, with variations not greater than 1%.

- skull length is 56-60% of head length. Kangal has a massive skull.

- nozzle constitutes 40-44% of head length. Nozzle is shorter than the skull.

- head width constitutes 52-57% of head length. When this is compared to skull length, it becomes clear that  Kangal's skull is almost quadratic in shape.

- nozzle width is 24-28% of head length

- nozzle depth is 32-36% of head length

# *Body indexes (N=126)*

| *Index* | *value* |
|---|---|
| *Back height* | 95-96 |
| *Rump height* | 1 |
| *Tail base height* | 92-94 |
| *Ankle height* | 22-35 |
| *Elbow height* | 53-54 |
| *Body format* | 111-112 |
| *Chest depth* | 33-44 |
| *Chest width* | 27-37 |
| *Chest circumference* | 112-113 |
| *Boniness index* | 21-22 |
| *Pelvis length* | 29-34 |
| *Pelvis width* | 9-19 |
| *Sit bone width* | 8-17 |
| *Head* | 39-40 |
| *Skull* | 56-60 |
| *Nozzle* | 40-44 |
| *Head width* | 52-57 |
| *Nozzle width* | 24-28 |
| *Nozzle width* | 32-36 |