**Determination of Relationships between Body Weight and Some Body Measurements Using Regression Equations for Anatolian Water Buffalo Raised in Istanbul**

M. İ. Soysal1\*, S. Genç2, M. Aksel3, E. K. Gürcan1

*1Namık Kemal University, Faculty of Agriculture, Department of Animal Science, 59100, Tekirdag, TURKEY*

*2Ahi Evran University, Faculty of Agriculture, Department of Agricultural Biotechnology, 40100, Kırsehir, TURKEY*

*3*Istanbul Water Buffalo Breeders Association*, Istanbul, 34100, TURKEY*

*\*Corresponding author e-mai:misoysal@gmail.com*

**Introduction** The aim of study was to determine possible relationships between body weight and several body measurements using regression equations as linear, multiple linear and nonlinear (polynomial) models for Anatolian water buffalo raised in Istanbul. In this way, breeders were estimated body weight from body measurement especially chest girth with regression equation without weighing. For this propose, total 214 head Anatolian water buffalos’ body weight, withers height, body length and chest girth were taken individually for female and male animal.

**Materials and methods** Animalmaterial of this study was consisted of total 214 head Anatolian water buffalos’ body weight (BW) and some body measurement like withers height (WH), body length (BL) and chest girth (CG). Body measurements and body weight of animal were taken measure cane, measure tape (cm) and weighbridge (kg). Descriptive statistics, correlation coefficient and linear, multiple and polynomial regression equations were researched for female and male animals. These regression equations were compared with coefficient of determination and the highest coefficient of determination were chosen best fitted model (Soysal, 2007). Data were analyzed using MINITAB package program (MINITAB, 2000).

**Results** The overall mean and standard error of the WH, BL, CG and BW were determined as 107.32 ± 0.84 cm, 105.47 ± 1.18 cm, 136.85 ± 1.73 cm and 192.64 ± 6.44 kg respectively. The effects of gender factor were found significant as statistically for WH, BL, BW (P<0.05). Phenotypic correlation were calculated between BW-WH, BW-BL and BW-CG 0.87, 0.80 and 0.92 respectively also in general group. At the same time, linear, multiple linear and nonlinear (polynomial) regression equation were compared with coefficient of determination with several tables. The best fitted model were shown to estimate body weight from body measurements at table 1 for female, male and general groups.

**Table 1.** The best fitted regression equations between body weight (BW) and chest girth (CG)

|  |  |  |
| --- | --- | --- |
| Gender (Model) | Regression Equation | Coefficient of Determination (R2) % |
| Female (Linear) | BW=-319.6+3.782CG | 86.3 |
| Female (Quadratic) | BW=155.6-3.111CG+0.02412CG2 | 94.6 |
| Female (Cubic) | BW=-33.4+1.26CG-0.00787CG2 +0.000074CG3 | 94.6 |
| Male (Linear) | BW=-209.2+2.877CG | 88.3 |
| Male (Quadratic) | BW=-181.8+2.489CG+0.001325CG2 | 88.4 |
| Male (Cubic) | BW=103.4-.3.612CG+0.04247CG2 -0.000087CG3 | 89.2 |
| General (Linear) | BW=-213.7+2.957CG | 82.7 |
| General (Quadratic) | BW=80.38-1.781CG+0.01853CG2 | 87.2 |
| General (Cubic) | BW=-96.9+2.654CG-0.01680CG2 + 0.000090CG3 | 87.3 |

**Conclusion** It was concluded that the breeders could be estimated body weight from chest girth with using these regression equation.

**References**

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