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A NEW EQUATION FOR ESTIMATION OF HORSES BODY WEIGHT

Shaker M. Merhish, Wael A. Khamas[1] and Nabeeh M. Atta
College of Veterinary Medicine, University of Baghdad, Baghdad-Iraq
[1]Faculty of Veterinary Medicine, Jordan University of Science and Technology, Irbid, Jordan

ABSTRACT

Fifty-five Iraqi Arabian horses of both sexes were used in this study in an attempt to derive a formula suitable for the prediction of body weight (BW) from the length of trunk (LT), heights at withers (HW) and croup (HC). Significant relationships between these variables were established and thus the following formula was derived: BW (kg) = HW (cm) X HC (cm) X LT (cm) X 0.0001. The calculated body weight was close to the actual body weight with an error around three per cent.

INTRODUCTION

Body weight is of importance in veterinary medicine, especially in racing horses and in determination of medicament doses. Besides, knowing the body weight is essential during transportation and in calculation of feed requirements. The difficulty in taking horses to weigh stations and the effort involved has to be taken into consideration together with the hazards they may encounter during transportation and handling. Therefore, researcher's have tried to derive formulae by which body weight could be predicted from body measurements as in draft horses and Shetland ponies (Evans *et al.*, 1977) and in dwarf horses (Milner and Hewitt, 1969). In Corriedale sheep, Kumar (1987) reported a significant correlation between body weight, trunk length, wither height and abdominal and thoracic circumferences, but unfortunately he did not put an equation to estimate body weight. The current work has the same objective for estimation of body weight in horses using certain conformation parameters.

MATERIALS AND METHODS

Fifty-five Arabian horses of both sexes were used in this study. They were weighed by a weigh-bridge made by Gascoignegush and Dent (Precision Weighers, Reading, England), and their body dimensions (height at wither and croup and length of trunk was recorded using a large caliber equine scale and measuring tape weighed them. Height at withers was measured from the highest point of the withers to the platform using equine scale. Croup height was measured from the highest point of the croup to the platform, while the length of the trunk was measured from the manubrium sterni to ischiatic tuberosity (Beeman, 1972, 1973). Stepwise multiple regression and Pearson's correlation coefficient were obtained after data analysis (Wannacott, 1985).

RESULTS

Significant and positive correlations ($P < 0.0001$) were established between body weight and the three measurements included in this study i.e., trunk length, wither height and croup height (Tables 1 and 2). The following equation was fitted to the data on these specific parameters with satisfactory accuracy:

Estimated body weight (kg) = HW X HC X LT X 0.0001 (All measurements are in centimeters).

DISCUSSION

Significant correlation's were established between actual body weight and three body measurements studied, with an error in the estimated weight around three per cent. The range of error that found in this study is less than those 10 per cent reported by Milner and Hewitt (1969) and five per cent reported by Kohnke (1987) in which the height of the wither was studied. In the Corriedale sheep, significant correlation was established between body weight and abdominal, thoracic circumferences, height at shoulder and trunk length (Kumar, 1987). Besides, Evans et al. (1977) estimated weights of draft horses and Shetland ponies with 10 per cent error by using the formula:

Estimated body weights in Lb (Heart girth)2 X Length/241.3 keeping in mind that length used is from the center of shoulder joint to the center of coxal joint and all measurements were in inches. While Milner and Hewitt (1969) used dwarf horses and extracted an equation with 5 per cent error from the actual body weights.

(Estimated body weights kg = Girth^2 X Length/ 660) [All measurements in inches]

In conclusion, the equation presented in this study is much simpler and percentage of error in comparison to other studies is much smaller as well.

Table 1: Measurements of differnet paratmeters of fifty Arabian horses

Variable	Mean	Std. Dev.	Minimum	Maximum
WH	149.018	4.759	137	158
CH	144.981	4.412	135	156
TL	142.181	5.399	132	156
ABW*	306.745	26.289	228	376
CBW**	306.836	25.623	243	362

* = Actual body weight; ** = Calculated body weight

Table 2: Pearson's correlation coefficients and probability

	WH	CH	TL	ACW	CBW
WH	1.0000	0.6550	0.5650	0.7920	0.8570
	0.0001	0.0001	0.0001	0.0001	0.0001
CH	0.6550	1.000	0.5040	0.7710	0.8270
	00	0.0001	0.0001	0.0001	0.0001
TL	0.5650	0.5050	1.0000	0.6510	0.8480
	0.0001	0.0	0.0001	0.0001	0.0001
ABW*	0.7920	0.7720	0.6510	1.0000	0.8640
	0.0001	0.0001	0.0001	0.0	0.0001
CBW**	0.8570	0.8270	0.8480	0.8640	1.000
	0.0001	0.0001	0.0001	0.0001	0.0

* = Actual body weight; ** = Calculated body weight

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