Equations for prediction of empty body weight of water buffaloes finished in feedlot

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Introduction

The methods used to predict body (or carcass) composition of water buffaloes can be classified as direct or indirect. Direct methods involve separating and dissecting all of the animal's body parts and determining their physical and chemical constituents.

Objective

This study aimed to develop equations to predict the empty body weight (EBW) using the shrunk body weight (SBW) of water buffaloes of three genetic groups (GG: Jafarabadi, Mediterranean, and Murrah; n=65 for each GG), considering possible variations among GG.

Material and Methods

One-hundred-ninety-five non-castrated males (390±32 days of age; 327±51.96 kg of initial body weight - BW) from two years of similar experiments were used. Animals of each GG were allocated in collective pens for 28 days of adaptation period. Diet and water were offered ad libitum. Animal SBW were recorded at the beginning and every 28 days until the averages SBW reached the values determined (420, 480, and 540kg of SBW). After slaughter and to obtain the EBW, the non-carcass components of each animal [blood, paws, head, leather, tail, gastrointestinal tract (GIT), liver, kidneys, internal fat, and other internal organs] were weighed.

The full GIT of each animal was weighed to obtain the total weight, and then emptied, washed, drained, and weighed to obtain the weight of the GIT content. Initially, data were analyzed using UNIVARIATE procedure in SAS. SBW recorded prior to slaughter were categorized according to SBW proposed considering the coefficient of variation below 10% for each GG to increase the precision of the data used, which decreased the initial n to 104 animals. Equations were developed and tested for GG effect using GLM and REG procedures in SAS.

Results

Tendency of GG effect was detected (P=0.06). Thus, different prediction equations were determined for each GG, and a general prediction equation was developed for the three GG (Table 1).

Table 1. Regression equations for predicting the empty body weight (EBW) by shrunk body weight (SBW) of water buffaloes from three genetic groups (GG) finished in feedlot

DV	IndV	GG	n	Estimate	RMSE	CV	SE	R^2	P-value
EBW, kg	SBW, kg	Jafarabadi	23	0.9617	18.381	4.169	0.079	0.8747	<0.0001
		Mediterranean	36	0.9314	12.040	2.764	0.039	0.9427	<0.0001
		Murrah	45	0.8176	9.044	2.076	0.029	0.9500	<0.0001
		General Equation	104	0,8909	12.972	2.969	0.026	0.9204	<0.0001

DV = dependent variable; IndV = independent variable; RMSE = root means square error; CV = coefficient of variation; SE = standard error; R^2 = coefficient of determination; Significance was declared at $P \leq 0.05$.

Highlights

- ✓ Estimate EBW for each genetic genetic group of water buffalo as a function of SBW.
- ✓ General equation to predict EBW as a function of SBW from water buffaloes .

Conclusions

In conclusions, the results suggest it is possible to use distinct equations to predict the EBW according to GG as well as a general equation can be also used, resulting in high predictions of EBW of water buffaloes finished in feedlot.

Figure: Procedures used to obtain the empty body weight of water buffaloes finished in feedlot.

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