Subjective measurements of fat cover and kidney knob and channel fat for predicting leg and rib tissue composition of Blanca Celtibérica kids.

Medidas subjetivas del grado de engrasamiento y cantidad de grasa pélvico renal para predecir la composición tisular de la pierna y costillar de cabritos Blanco Celtibéricos.

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SUMMARY

CCW, the assess of FC on two scores (1-5) and (1-15) and the assess of KKCF amount on two scores (1-3) and (1-9) were used as predictors of leg and rib tissue composition of 31 Blanca Celtibérica kids, with an average CCW of 6,9± 2,1 Kg.

Proportionately 97% of the variation in muscle weight was accounted for by variation in CCW and the inclusion of KKCF amount scored from 1 to 9 improve the precision of the prediction 1%, reducing the RSD in 11,8%. The inclusion of KKCF amount (scored 1-3) did not improve the precision of the rib muscle composition but reduced the RSD in 6,2%.

In relation to bone composition of both joints, 95% and 73% of the variation of the leg and rib bone weight, respectively were accounted for by variation on CCW.

The 87 and 85% of the leg and rib fat weight variation were accounted for by variation in CCW associated with fat score (1-15) and KKCF amount (1-3) with a RSD of 17 and 32,4 g, respectively.

ADDITIONAL KEYWORDS: Kids, Prediction, Tissue composition, Leg, Rib.

RESUMEN

El peso canal fría, grado de engrasamiento con dos escalas de (1-5) y de (1-15) puntos y cantidad de grasa pélvico renal con dos escalas de puntuación (1-3) y (1-9) fueron utilizados como predictores de la composición tisular de la pierna y costillar de 31 cabritos de raza Blanca Celtibérica, con una media de peso canal fría de 6,9± 2,1 Kg.

La variación del peso canal fría explicó el 97% de la variación en el peso del músculo de ambas piezas y la entrada en el modelo de la cantidad de grasa pélvico renal (1-9) incrementó un 1% la precisión de la estimación del peso del músculo del costillar con una reducción asociada del RSD de un 11,8%. A su vez la entrada en la ecuación de predicción del peso del músculo del costillar, de la cantidad de grasa pélvico renal (1-3) no mejoró la precisión de la estimación, pero sí que supuso un 6,2% de reducción del RSD.

Respecto a la predicción del peso del hueso en ambas piezas, el 95% de la variación en el peso del mismo en la pierna, fue explicado por la variación en el peso de la canal fría, mientras que la variación en el peso de esta misma variable tan solo explicó el 73% de la variación en el peso del hueso del costillar.

Finalmente, la variación del peso canal fría, engrasamiento (1-15) y cantidad de grasa pélvico renal (1-3) explicó el 87 y 85% de la variación en el peso de la grasa total de la pierna y costillar con unas RSD asociadas de 17,0 y 32,4 g, respectivamente.

PALABRAS CLAVE ADICIONALES: Cabritos, Predicción, Composición tisular, Pierna, Costillar.

INTRODUCTION

A lack of information exists about Spanish goat breeds, mainly for meat gat breeds, reason by the studies on the productive characterization of these genotypes are totally justified and particularly the works concerning the quality of the carcass and the meat of their kids (Delfa et al., 2005a,b)

Unfortunately there are very few Works on this subject in the universal bibliography. Recently Morand-Fehr and Lebbie (2004) recognized the necessity to analyze the present situation with the purpose of preparing it for the challenges of a next future, due to have none or not enough knowledge of this species (Devendra, 2000; Lebbie,2000).

For Delfa and Teixeira (1998), the evaluation of the quality of the carcass and its economic value, it must be based on the proportion of pieces obtained from the carcass and on the tissue composition of each piece. So the main goal of this study was to evaluate the accuracy of the use of cold carcass weight (CCW) and the different subjective measurements of fat cover (FC) and kidney knob and channel fat (KKCF) for predicting leg and rib tissue composition of Blanca Celtibérica kids.

MATERIAL AND METHODS

CCW, FC with two scales of annotation (1-5) and (1-15) points and KKCF with other two scales of annotation (1-3) and (1-9) points, according to the methodology pointed out by Colomer-Rocher et al. (1988) and Delfa et al. (2005c, d), were scored by two expert evaluators and used for leg and rib tissue composition prediction on 31 Blanca Celtibérica kids ranking a live weight of 6,9 ± 2,1 Kg.

The left sides of carcasses were cutting and each joint dissected according to the Standardized Reference Methodology proposed by Colomer-Rocher et al. (1987, 1988).

Data were statistical analyzed using a stepwise regression procedure by (Bendel y Afifi, 1977 y Wilkinson, 1989), on the purpose of knowing the degree of precision (in terms of percentage of explained variance) of the CCW and assigned notes the FC and KKCF.

RESULTS AND DISCUSSION

On Tabla 1 and 2 are shown the percentages of variation explained (R^2) and residual standard deviations (RSD) of weight of leg and rib tissue composition accounted for by CCW, subjective measurements of FC and KKCF.

Proportionately 97% of the variation in muscle weight was accounted for by variation in CCW and the inclusion of KKCF amount scored from 1 to 9 improve the precision of the prediction reducing the RSD in 11,8%. The inclusion of KKCF amount (scored 1-3) did not improve the precision of the rib muscle composition but reduced the RSD in 6,2%.

As we was commented on the introduction we not found any reference on the subject of the present work. Nevertheless Delfa et al. (2005a) working with kids from the same breed predicted the 99% of the variation in carcass muscle weight using a multiple regression equation with CCW and KKCF (1-9) as independent variables.

In relation to bone composition of both joints, 95% and 73% of the variation of the leg and rib bone weight, respectively were accounted for by variation on CCW. Delfa et al. (2005a) also found a R^2 of 0,95 for carcass bone weight predicted CCW and FC (1-15) in a multiple regression.

The 77 and 82% of the variation on the weight of subcutaneous fat of leg and rib were accounted for by CCW and FC (1-15) variation. Delfa et al. (2005a) explained the 84% of the variation of carcass subcutaneous fat weight using an multiple regression with the same variables plus the KKCF (1-3).

In reference of leg and rib intermuscular fat the 87 y 88%, respectively, of the variation were accounted for by variation in the CCW and FC (1-15). The same variables explained the 94% of the variation of the same carcass tissue in a work by Delfa et al. (2005a).

The pelvic (0,74) and kidney (0,71) fat were the fat depots worst predict by the independent variables.

Finally, the 87 and 85% of the leg and rib total fat weight variation were accounted for by variation in CCW associated with FC (1-15) and KKCF amount (1-3) with a RSD of 17,0 and 32,4 g. respectively. Nevertheless Delfa et al. (2005a), using the same variables explained the 90% of the variation of total carcass fat weight.

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Table 1. Percentage variation (R^2) and residual standard deviations (RSD) of weight of leg tissue coposition (g) accounted for by cold carcass weight, subjective measurements of fat cover and kidney kuob and channel fat. Prediction equations of weight of leg tissue composition with indication of coefficients (b) and the intercept (a)

Steps	DependentVariate (y)	Independent Variate (x)	R^2	RSD	b	Sb	Intercept
1	Muscle	CCW	0,97 **	41,7	111,6	3,7	3,74
2		KKCF (1-3)	0,97 **	39,1	-32,4	14,6	
1	Bone	CCW	0,95 **	14,0	30,7	1,3	49,3
2		FC (1-5)	0,96 **	12,8	-14,8	5,8	
1	Subcutaneous fat	FC (1-15)	0,69 **	11,1	7,3	1,2	-6,0
2		CCW	0,77 **	9,7	3,2	1,0	
1	Intermuscular fat	CCW	0,84 **	6,6	6,3	0,7	6,1
2		FC (1-15)	0,87 **	6,2	1,8	0,8	
1	Pelvic fat	KKCF (1-9)	0,55 **	7,8	3,8	0,7	-5,9
2		CCW	0,74 **	6,0	2,6	0,6	
1	Total fat	CCW	0,71 **	24,2	12,2	1,8	-16,4
2		FC (1-15)	0,84 **	18,0	8,1	2,7	
3		KKCF (1-3)	0,87 **	17,0	16,3	7,9	

NS = Not significant; * P≤ 0,05; ** P≤0,001

Table 2. Percentage variation (R^2) and residual standard deviations (RSD) of weight of rib tissue coposition (g) accounted for by cold carcass weight, subjective measurements of fat cover and kidney knob and channel fat. Prediction equations of weight of rib tissue composition with indication of coefficients (b) and the intercept (a)

Steps	DependentVariate (y)	Independen Variate (x)	R^2	RSD	b	Sb	Intercept
1	Muscle	CCW	0,97 **	30,6	85,4	2,5	-38,1
2		KKCF (1-9)	0,98 **	27,0	-10,0	3,2	
1	Bone	CCW	0,73 **	24,1	18,5	2,1	24,0
1	Subcutaneous fat	CCW	0,71 **	12,0	6,2	1,0	-27,4
2		FC (1-15)	0,82 **	9,5	5,2	1,2	
1	Intermuscular fat	CCW	0,83 **	11,2	9,5	1,0	-14,6
2		FC (1-15)	0,88 **	9,5	4,3	1,2	
1	Kidney fat	FC (1-15)	0,59 **	22,1	7,8	3,0	-24,5
2		KKCF (1-9)	0,66 **	20,4	7,1	2,8	
3		CCW	0,71 **	19,3	4,2	2,0	
1	Total fat	CCW	0,66 **	46,2	20,2	3,4	-91,5
2		FC (1-15)	0,82 **	34,8	14,3	5,2	
3		KKCF (1-3)	0,85 **	32,4	34,8	15,0	

NS = Not significant; * P≤ 0,05; ** P≤0,001