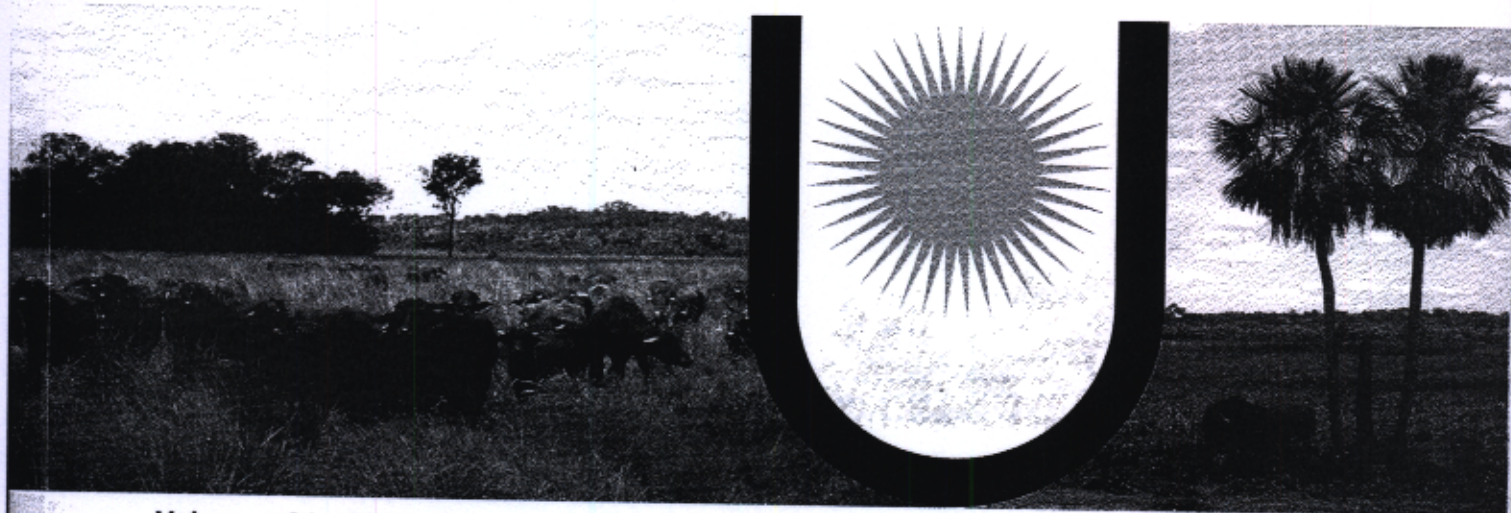


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Correlations between Linear Measurements and Milk Production in Murrah Buffaloes*¹

Andréa MV¹; Cerqueira RS¹; Marcondes CR²; Macedo Junior CM¹; Santos DR¹; Oliveira KN¹

¹Universidade Federal do Recôncavo da Bahia, Campus Universitário de Cruz das Almas, CEP 44.380-000, Cruz das Almas-BA, Brazil. mariaandrea115@hotmail.com

²Embrapa Amazônia Oriental, Tv. Dr. Enéas Pinheiro, s/n, CEP 66095-100, Belém-PA, Brazil. cimarcon@cpatu.embrapa.br

INTRODUCTION

The growing demand for products made from buffalo's milk causes properties to utilize technologies that – in combination – make production more lucrative and suitable in terms of hygiene, quality, quantity, availability and sustainability¹. The different selection criteria that are available for dairy cattle farming associated with type measurements – despite the rare reports on buffalos – are meaningful for improvement programs of the species². Some traits refer to the same part of the body, like basic form and strength of the body, which have a high genetic correlation of 0.91³. In this case, only some measurements can be selected to study genetic parameters and, later, to be used as selection criteria.

Keywords: *Bubalus bubalis*, animal production, biometrics, improvement program.

MATERIAL AND METHODS

Eighty-four Murrah females kept in the Recôncavo of Bahia (12°30'50.00"S and 38°29'42.64"W) have been assessed in order to enable data collection, the preliminary description of patterns and the study of the association of linear measurements with milk production for the breed. The data were saved in an Excel-for-Windows spreadsheet.

The animals were between the 104th and 161st day of lactation (DL, average of 134 days), and the parturition order (OP) ranged between 1 and 10. The following measurements (in meters) were taken into account: stature (EST), body depth (PROF_CORP), substernal depth (PROF_SUB), ilium width (ILIO), ischium width (ISQ), rump width (LAR_GAR), rump slope (DECL), body length (COMP_CORP), thoracic perimeter (PT) and rump length (COMP_GAR), and also milk production (PL, in kg) and days in milk (DL, in days). The analyses were completed with the Statistical Analysis System (SAS, 2002) to generate phenotypic correlations and descriptive statistics.

1 * Embrapa MP2 Project number 02.07.07.009.00.03

RESULTS AND DISCUSSION

The descriptive statistics for all measurements are shown in Table 1.

Table 1. Mean, standard deviation (SD) and minimum and maximum values for Murrah female buffaloes at Recôncavo da Bahia, Brazil.

Trait	Unit	Mean	SD	Min	Max
Stature (EST)	m	1.39	0.04	1.30	1.49
Body depth (PROF_CORP)	m	0.75	0.04	0.66	0.85
Body length (COMP_CORP)	m	1.42	0.08	1.26	1.60
Substernal depth (PROF_SUB)	m	0.61	0.03	0.55	0.68
Ilium width (ILIO)	m	0.62	0.04	0.53	0.74
Ischium width (ISQ)	m	0.35	0.03	0.28	0.44
Rump width (LAR_GAR)	m	0.49	0.03	0.43	0.59
Rump slope (DECL)	m	0.14	0.01	0.11	0.16
Rump length (COMP_GAR)	m	0.45	0.03	0.38	0.51
Thoracic perimeter (PT)	m	2.10	0.11	1.79	2.34
Milk production (PL)	kg	7.84	3.37	2.60	14.00
Days in milk (DL)	days	134	17	104	161

The official standard in Brazil for the Murrah⁴ considers that the average height for females is 1.32m and that of males is 1.40m, i.e., four out of the 84 females in the study were shorter than the standard, and 36 others presented an average height similar to that of males. The rump measurements (ILIO, ISQ, LAR_GAR, DECL and COMP_GAR), COMP_CORP and PT were significantly ($P<0.05$) correlated with EST and PROF_CORP, as shown in Table 2. However, it can be noticed that rump slope (DECL) is not phenotypically related to other measurements, except for its small correlation with stature (EST), which equals 0.28. Body depth and body length show only 0.67 correlations, which suggests that the herd was comprised of deeper and shorter females, as well as females that were long and not very deep. PROF_SUB correlated negatively with PT and PROF_CORP (-0.26 and -0.30, respectively), PL showed positive correlation with EST and PROF_CORP (0.32), and DL with ILIO (0.36), ISQ (0.51) and LARG_GAR (0.47). Because they have been adjusted from an Italian spreadsheet⁵ for Mediterranean females that considers metric measurements rather than the scores as the original, it is possible to submit the means obtained for the Murrah in this study to the Italian classifications. The buffaloes in this study are, therefore, tall, not very deep, they have wide ilia and extremely wide ischia, and long and very slope rumps. Including buffalo's biometric measurements in improvement programs, following the study of genetic parameters, can be useful for the productivity and longevity of females in the herds kept for dairy farming.

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GENETICS

Table 2. Phenotypic correlations between rump measurements (ILIO, ISQ, LARG_GAR, DECL and COMP_GAR), thoracic perimeter (PT), stature (EST) and body depth (PROF_CORP) for Murrah females at Recôncavo of Bahia, Brazil.

	ILIO	ISQ	LARG_GAR	DECL	COMP_GAR	COMP_CORP	PT	EST	PROF_CORP
ILIO	1.00	0.52	0.91	ns	0.57	0.62	0.53	0.50	0.60
ISQ		1.00	0.82	ns	0.22	0.45	0.31	0.34	0.41
LARG_GAR			1.00	ns	0.48	0.63	0.50	0.51	0.60
DECL				1.00	ns	ns	ns	0.28	ns
COMP_GAR					1.00	0.70	0.60	0.55	0.57
COMP_CORP						1.00	0.68	0.54	0.67
PT							1.00	0.56	0.86
EST								1.00	0.64
PROF_CORP									1.00

ILIO = ilium width; ISQ = ischium width; LARG_GAR = rump width; DECL = rump slope; COMP_GAR = rump length; COMP_CORP = body length; PT = thoracic perimeter; EST = stature; PROF_CORP = body depth.

ns = non-significative