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FACTORS AFFECTING THE AUCTION PRICE OF VELDRAM PERFORMANCE TESTED DORPER RAMS IN NAMIBIA

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ABSTRACT

Veldram performance testing has been conducted over a period of 14 years (1988 to 2002) at Kalahari Research Station in Namibia. During this period 2660 Dorper rams participated in 22 tests. Rams that met growth and breed standards were put up for auction at the completion of each test. The popularity of these auctions for performance tested rams (89.4 % of rams sold) indicate that Veld tested rams were sought after by buyers.

The sale price of 296 Veld tested Dorper rams sold between 1994 and 2001, covering seven different tests, were compared with their measured and observed performances. Multiple regression and analysis of variance were carried out to determine which of the factors that were available to buyers significantly influenced price, as well as its contribution towards ram prices fetched. The contributing factors that had the biggest effect on price were Breed Classification (BC), Selection Index (SI), Average Daily Gain (ADG) and End test Mass (EM). This indicates that buyers did recognize the importance of performance data in selecting breeding rams and but most emphasis was on Breed standards (visual appearance).

Although Breed Classification is the industry standard used by buyers, top ranking rams (stud) did not perform consistently/significantly better than flock rams.

1. INTRODUCTION

One of the most important economic decisions facing sheep breeders is the acquisition or provision of genetically superior sires (Campbell, 1962:60). The stud breeder needs to prove that (s)he provides genetically superior breeding animals to buyers. Globalisation in the livestock market, export of breeding material and AI accentuate the importance of reliable breeding values for sires in any stock-breeding program.

Determination of the relative economic importance of traits emphasized in breeding and selection is a fundamental problem for animal breeders. This problem can be addressed by obtaining the relationship between auction price and the merit of animals sold, since the buyers' willingness to pay more for animals of greater apparent merit in specific traits is one measure of the worth of these traits (Terrill, 1953:419).

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If buyers of centrally tested rams consider performance evaluation measurements to be meaningful in decision making, higher performing rams should sell for higher prices than lower performing rams.

The practice of sire-selection based on breed standards alone, i.e. phenotypic criteria, has been scientifically proven to be limited in achieving the objective of selection for genetically superior animals (Roux, 1961; Van der Merwe and Poggenpoel, 1977; Olivier, 1980; Roberts, *et al*, 1991; Neser, Konstantinov & Erasmus, 1995; Bosman, 1997). Centralised performance testing and progeny testing has become standard practice in the identification of superior individual animals for the genetic advancement of flocks and breeds and is currently practiced on a global scale (Poggenpoel, 1989:50; Dreyer, 1988:23-33; Nel, 1993:203; Pretorius, 1994:20-23 & Olivier, 1997:34-35).Yet, Olivier & Cloete (2006:1) reported that breed improvement of the Dorper is still based mainly on subjective assessment in the show ring.

Red meat production is an important commodity in Namibia. Lamb and mutton produced from the Dorper (representing 64% of sheep numbers) comprises the largest percentage of mutton sold in Namibia (Dir. Vet. Serv. Census, 2005). Lamb is also exported to South Africa (5 000 t/annum) and Scandinavia (500 t/annum), which contributes significantly to Namibia's annual income from exports (Müsellier, 2005). Total Namibian Dorper numbers add up to about 1.7 million, located mainly in the central and southern part of the country. Estimates indicate that approximately 8 000 rams per annum are required to maintain current production levels (Von Schauroth, 2007:1). To keep its market advantage, continuous effort towards scientific/genetic advancement of the breed is crucial.

Production from extensive arid areas covering most of the RSA and Namibia (Nel, 1980:305; Fourie, 1999:1) may be increased by selection of adapted breeding animals with the genetic make-up for efficient use of natural pastures with the least cost (Nel, 1980:306; Neser, 1999:28; Cloete, Snyman & Herselman, 2000:119; Ramsay, Swart, Olivier & Hallowell, 2000: 339; Von Schauroth, 2007:1). The adverse effects of global warming on the drier parts of Southern Africa stresses the importance of identifying adapted genetic material through centralised testing under extensive conditions. Du Pisani (2001:31) analysed rainfall statistics across Namibia, indicating a negative trend in mean annual rainfall.

Namibian National Veldram performance testing has been conducted from 1988 to 2002 at the Kalahari Research Station in Namibia. Tests were conducted as a joint venture between the Ministry of Agriculture and different small stock Breeders' Societies of Namibia. Over this period 2 660 Dorper rams participated in 22 tests. These tests were discontinued in 2003. The perception of buyers on the importance of measured and observed traits, analysed for their contributing effect on auction price of rams is a good indication for scientists and breed societies on the direction they need to take for rapid advancement of their respective breeds.

The purpose of this paper is to determine what factors ram buyers in Namibia placed most emphasis on in choice of ram as indicated by its contribution to sale price and how it corresponds with analyses by other authors as a base for future planned advisory action.

2. MATERIALS AND METHODS

2.1 Test area and -procedures

The Dorper Club of Namibia in co-operation with the Ministry of Agriculture and Rural Development implemented Veld ram centralized performance test for Dorper rams in 1988 at Kalahari Research Station (Farm: Rohrbeck) near Stampriet in the Hardap region. Average yearly rainfall is 224 mm.

The test area is situated in the Mixed Tree and Shrub Savanna of Namibia (Giess, 1971:25). Veldram performance testing has been conducted over a period of 14 years (1988 to 2002). Data available for 22 tests from 1988 to 2002 record 2 660 Dorper rams entered. Of these 1193 (44.8 %) rams met all growth, health, fertility and breed standards and were put up for auction; with 1067 (89.4%) sold. Of the auctioned animals 116 were classified as stud and 1077 as flock rams. After the conclusion of each test lasting between 150 to 180 days, the rams were sold at public auction. Each ram was provided with a certificate that included the measured results of the test.

Rams were evaluated and measured according to the rules for Dorper Veldram Sales of the Dorper Sheep Breeder's Society of South Africa (Grobler, 2005:4; Dorper Sheep Breeders' Society of SA, 2007:1-6).

Rams with an ADG index higher than 80 (85 for stud rams), a positive semen quality and classed by the breed inspector into respective Breed Selection Categories (e.g. stud, flock), were then feedlotted and conditioned for six weeks prior to auction.

2.2 Information available to the Buyer - Auction procedure and Catalogue

Rams were available for inspection before the auction. The ram's card with its performance measurements (Table 1, excluding Sale price) were available (Binnenman, 2009, personal communication). The auction catalogue contained the ram number, its ADG index, Breeder and from 1997 also Selection index. Breed classification (ram classed according to breeding standards) was indicated by marker on each ram at the auction. The ram auction order was determined by the ADG index of the rams, per breeder. The rams were then auctioned from best merit to poorest.

2.3 Statistical analyses

Auction data for only seven Veldram tests were available for analyses (Table 1). These auction data (Table 1) were used to determine the influence of ram growth performance, Breed Classification and body measurements on sale price. Body measurements for five of the mentioned seven tests were also available and included in the analyses.

Table 1: Data available for different intakes.

Available data	Test Intake						
	1994_2	1997_1	1998_1	2000_1	2000_2	2001_1	2001_2
BC[1]	√	√	√	√	√	√	√
ADG-I[2]	√	√	√	√	√	√	√
SI[3]	0	√	√	√	√	√	√
Starting mass[o]	√	√	√	√	√	√	0
End mass*	√	√	√	√	√	√	0
Starting SH[4]	√	√	√	√	√	0	0
End SH[4]	√	√	√	√	√	0	0
Starting BL[5]	√	√	√	√	√	0	0
End BL[5]	√	√	√	√	√	0	0
Starting BW[6]	√	√	√	√	√	0	0
End BW[6]	√	√	√	√	√	0	0
Starting SC[7]	√	√	√	√	√	0	0
End SC[7]	√	√	√	√	√	0	0
Breeder[8]	√	√	√	√	√	√	√
Sale Price	√	√	√	√	√	√	√

[1]-Breed Classification [2]-Average Daily Gain Index [3]-Selection Index
[4]-Shoulder Height [5]-Body Length [6]- Body Width [7]-Scrotal Circumference
[8]-Breeder *- off test
√ -Available data 0 - Data not available

A selection index comprised of final test mass and ADG, contributing equally based on economical weight (Olivier, 2005), was reflected in catalogues since 1997. Selection index has been propagated as a good indicator for overall mutton ram performance in Veldram tests (Fourie, Neser, Olivier, & Van der Westhuizen, 2002:256).

All available factors, possibly affecting sale price, were considered for inclusion in statistical models. However 'on test' starting measurements were not considered as earlier authors have shown that the final measurements and appearance on the day of auction has the most influence on price (Lester et al, 1983:47; Fitch, Butler, Golden & Denham, 1986:212; Waldron et al, 1989:1199 – 1207; Poggenpoel, 1989:51).

Regression analyses were performed to establish the contribution of each individual factor on sale price. C(p) selection criterion, analyzing all possible combinations, and stepwise regression analysis were executed to select the best fitting equations. Each year was analysed separately in order to observe trends in factors affecting sale price over time (Table 2). A single regression model was also fitted on the combined sale data for intakes 1997_1 to 2000_2, to compare the results of year models with the combined effect (Table 3). Factors affecting sale price included in the multiple regression models are Breed Classification, ADG-Index, Selection Index (SI), End Test Mass (EM), End Shoulder Height (SH), End Body Width (BW), End Body Length (BL) and End Scrotal Circumference (SC). It was difficult to verify breeder as contributing factor in the regression models as breeders differed between sales and did not exhibit rams in every breed category, confounding breeder effect with other

effects. Breeder as contributing factor was therefore excluded from regression models but was included in the analysis of variance models (Table 4), due to the nature of the fitted model.

Analysis of variance (ANOVA) models were fitted on sale price employing the type III sum of squares (SS) using the GLM (General Linear Models) procedure of SAS statistical software version 9.1 (SAS Institute Inc., Cary, NC, USA)). In the Anova models only the main price contributing factors selected through regression analyses were included to quantify the effect of these factors. Student's t-least significant difference was calculated at the 5% level to compare factor means (Ott, 1998). A probability level of 5% was considered significant for all significance tests.

Yearly stepwise regression analyses presented in Table 2 indicate that Breed classification (subjective classification) and ram growth performance (objective classification), either through ADG Index or Selection Index (growth combined with end mass), influenced sale prices significantly in every year. Breed classification was a substantial influencing factor, being the most important factor in five of the seven years and exerting a significant influence on price in all of the seven years. This is expected as stud rams realize better prices on auctions in spite of the fact that some registered rams had higher merit through performance indexes (Terrill, 1953:428; Fitch, *et al*, 1986:212; Fourie, 2000:131). The influence of body measurements on price, measured nearest to auction, indicate the influence of the presented animal to the buyer.

These findings confirm the view expressed by Poggenpoel, (1989:51) that low correlations between sale price and measured performance may be due to the fact that measurements were taken six months before the auction of Veldram tested Merino's and is reflected in the partial contribution to the R^2 of auction weight (12.86 to 68.68) over 10 Dorper Veldram tests at Griekwastad, reported by Fourie (2000:131).

Von Schauroth (2007,iii,18), analysing growth and body measurements of Namibian Dorper rams has shown that Body width and Body length are highly correlated with End mass and make the largest contribution of measurements to End mass. Body measurements chosen by the model may thus be related to End mass.

Except for the 1994_2 intake (0.3064), the model R^2 ranged between 0.6804 (1997_1) to 0.8486 (2000_2) indicating that the factors included by the regression selection explain the price influencing factors substantially.

The combined model for intake 1997_1 to 2000_2 (Table 3) clearly shows Breed Classification with a partial contribution of 35.83% on price as the main ram sale price influencing factor with ram performance factors contributing substantially less. This is in accordance with the findings of Fourie (2000:131) reporting Breed Classification making the largest contribution to auction price in most years. Selection Index was the main ram performance measurement influencing price, as expected. SI as an indication of combined ram growth performance measurements contributed less than half (16.6%) of the BC contribution (35.8%) to model R^2. ADG-I and End Mass made small contributions, although as variables they are incorporated in Selection Index. This indicates the influence of ram registration according to breed standards on how buyers value a ram.

Table 2: Stepwise regression models, reflecting factors substantially affecting sale price of Dorper rams for each specified intake

Test intake	Analysis	Variables				Model R^2	n
1994_2	Model	End mass*	BC[1]			0.3064	32
	Par con[a]	0.1931	0.1132				
	C(p)	7.5690	4.5767				
	p[b]	0.0118	0.0378				
1997_1	Model	BC[1]	SI[2]	ADG-I[5]	End BW[3]	0.6804	57
	Par con[a]	0.3072	0.2955	0.0368	0.0408		
	C(p)	56.3462	16.0255	6.6508	2.3520		
	p[b]	<0.0001	<0.0001	0.0239	0.0129		
1998_2	Model	BC[1]	SI[2]	End BW[3]	End BL[4]	0.7609	53
	Par con[a]	0.4700	0.2420	0.0287	0.0202		
	C(p)	50.8956	7.2913	3.8805	2.0672		
	p[b]	<0.0001	<0.0001	0.0240	0.0495		
2000_1	Model	BC[1]	ADG-I[5]			0.7262	53
	Par con[a]	0.6768	0.0494				
	C(p)	7.2958	0.6985				
	p[b]	<0.0001	0.0042				
2000_2	Model	SI[2]	BC[1]			0.4720	41
	Par con[a]	0.3045	0.1675				
	C(p)	11.5774	1.8783				
	p[b]	0.0002	0.0013				
2001_1	Model	BC[1]	SI[2]			0.8486	30
	Par con[a]	0.8084	0.0401				
	C(p)	7.1148	2.1778				
	p[b]	<0.0001	0.0125				
2001_2	Model	BC[1]	SI[2]	ADG-I[5]		0.7828	30
	Par con[a]	0.6967	0.0446	0.0415			
	C(p)	10.3093	6.9723	4.0000			
	p[b]	<0.0001	0.0401	0.0346			

[1]-Breed Classification [2]- Selection Index [3]- Body Width [4]-Body Length [5]- Average Daily Gain Index [*]- Final test mass
[a]-partial contribution towards model R^2 [b] – probability

Table 3: Combined Stepwise regression model for four intakes (1997_1 to 2000_2), reflecting factors significantly affecting sale price (Real price) of Dorper rams

Test intake	Analysis	Variables				Model R^2	n
1997_1 to 2000_2	Model	BC[1]	SI[2]	End mass*	ADG-I[3]	0.5606	204
	Par con[a]	0.3583	0.1660	0.0169	0.0195		
	C(p)	92.1706	18.5778	12.8823	6.0159		
	p[b]	<0.0001	<0.0001	0.0072	0.0033		

[1]-Breed Classification [2]- Selection Index [3]- Average Daily Gain Index *- Final Test Mass
[a]-partial contribution towards model R^2 [b] – probability

To quantify the effects of the selected variables or factors, identify any interaction between them and verify the influence of ram breeder (ram origin), included as a categorical variable on sale price, the analysis of variance, type III SS, are presented in Table 4. Variables included are Breed Classification, Breeder and Selection Index. Average Daily Gain and End Mass are not included as these measurements are embedded in Selection Index. Probabilities presented in bold indicates the significant effects.

Table 4 confirms that the significant factors influencing price are Breed Category and Selection Index (1997_1, 2000_1 and 2000_2). Although there are significant interactions between Breeder and Breed Classification in 1989_2 and 2001_2, and Selection Index and Breed Classification in 1989_2, this can generally be explained by exceptions to the rule. This happened when a flock ram with very high index values achieved a higher than expected sale price. This then increases the simultaneous significance of the named two factors to four years out of six. Breed Classification influenced price significantly in all 6 years, showing its meaningful influence on ram price. Breed Classification is followed by Selection Index, significant in four years, considering the interaction effects as a defendable exception to the rule.

The effect of Breeder (owner) on sale price could not be significantly established. Waldron, et al, (1989:1206), reporting on ram sale price influencing factors from ram test centres in the American Mid West found ram performance to be more important in determining sale price than ram owner at the Ohio ram test centre, while the opposite was the case in Illinois, Wisconsin and Indiana test centres. In Iowa they were equally important.

The means of the variables in the models for each intake are presented in Tables 5 and 6. Realised price means for Breed Classification category (Table 5) show clearly that for each intake stud rams significantly fetched higher prices than flock rams, as is to be expected. This indicates that Breed Class (e.g. stud) is the accepted norm used by ram breeders to evaluate rams for genetic excellence and also perceived as such by the buyers of breeding rams.

Table 6 presents the Real Price means for the six intakes according to Selection Index category incorporated in the model. The differences in Real Price means between the Selection index categories per intake show a tendency for the higher indexed rams to fetch higher prices than the lower indexed rams. Rams indexed above 115 fetched significantly higher prices than lower ranked rams in four of the six intakes. These tendencies are not clearly differentiated in all years as there is no significant difference in average price received in year 2001_2; the order between the top two categories being reversed in year 2001_1. The same results for the bottom two categories in year 2000_1. Rams ranked above average (>100) received significantly higher prices than below average rams in only three of the six intakes. No trend over time is observed.

Table 4: Analyses of variance of Breed Classification, Breeder, Selection Index and interactions on Real Price for the intakes, 1997_1 to 2001_2.

Intake	**1997_1**			**1998_2**			**2000_1**			**2000_2**			**2001_1**			**2001_2**		
Variable	**DF[1]**	**MS[2]**	**P**	**DF[1]**	**MS[2]**	**P**	**DF[1]**	**MS[2]**	**P**	**DF[1]**	**MS[2]**	**P**	**DF[1]**	**MS[2]**	**P**	**DF[1]**	**MS[2]**	**P**
BC[3]	1	9796.23	**.0062**	1	7260.69	.0004	1	23115.23	**.0001**	1	2224.54	**.0696**	1	15144.31	**.0001**	1	43758.15	**<.0**
SI[4]	2	7687.32	**.0038**	2	6251.00	<.0001	3	1790.85	**.0031**	2	5131.32	**.0030**	3	759.97	.2745	2	93.51	.7
BC[3]xSI[4]	0	.	.	1	2855.48	**.0125**	0	.	.	0	.	.	0	.	.	1	1018.81	.0
BDR[5]	11	1822.81	.1415	14	395.57	.4264	17	504.88	.0956	12	718.77	.3452	8	168.38	.9459	6	1223.46	.0
BDR[5]xBC[3]	3	2822.81	.0765	4	1160.81	**.0407**	1	38.53	.7087	0	.	.	0	.	.	1	1917.85	**.0**
BDR[5]x SI[4]	12	1111.19	.4661	12	539.32	.2234	10	400.56	.2190	8	576.22	.4815	4	160.71	.8708	4	126.17	.7
BDR[5]x BC[3]x SI[4]	0	.	.	2	1224.75	.0591	0	.	.	0	.	.	0	.	.	0	.	
Error	25	1096.47		16	360.99		18	267.51		15	582.54		14	529.4			277.61	

[1]- Degrees of Freedom [2] - Mean Squares [3]- Breed Classification [4]- Selection Index [5]- Breeder

Table 5: Real Price means for Breed Classification in six intakes.

Intake	**1997_1**			**1998_2**			**2000_1**			**2000_2**			**2001_1**			**2001_2**		
Treatment	**N**	**Real Price (R)**		**N**	**Real Price (R)**		**N**	**Real Price (R)**		**N**	**Real Price (R)**		**N**	**Real Price (R)**		**N**	**Real Price (R)**	
Flock	51	91.21	b	44	90.51	b	49	89.41	b	38	86.83	b	26	80.74	b	26	83.73	b
Stud	6	181.03	a	9	156.27	a	9	206.96	a	4	125.78	a	5	200.18	a	4	205.78	a
LSD (P=0.05)		29.43			14.74			17.87			27.04			24.10			19.33	

Table 6: Real Price means for Selection Index category for the six intakes.

Intake	**1997_1**			**1998_2**			**2000_1**			**2000_2**			**2001_1**			**2001_2**		
SI category	**N**	**Real Price (R)**		**N**	**Real Price (R)**		**N**	**Real Price (R)**		**N**	**Real Price (R)**		**N**	**Real Price (R)**		**N**	**Real Price (R)**	
0 – 85	0	.		0	.		2	91.28	b	0	.		1	46.34	c	0	.	
86 - 100	20	72.62	c	24	82.40	b	8	82.25	b	9	59.16	c	8	67.19	bc	12	91.73	a
101 - 115	29	105.83	b	28	114.97	b	29	95.15	ab	21	88.84	b	16	121.06	a	17	104.50	a
> 115	8	152.06	a	1	191.89	a	14	114.93	a	12	117.04	a	6	96.54	ab	1	122.85	a
LSD (P=0.05)		25.49			34.14			20.77			20.67			40.61			31.41	

This tend to confirm that Breed classification is perceived to be the practical industry standard, used by breeders and commercial producers to identify rams for genetic and performance advancement of their flocks, it is thus important to know if rams classified as stud, presented as the most excellent breeding material, did perform best under growth tests.

Von Schauroth (2007:iii) reporting on Namibian Dorper Veldram data indicated that breed inspectors, when evaluating rams at the test station, ignored performance data, preferring visual appearance for categorizing rams.

In Table 9, ANOVA's on the influence of 'Breed Classification' categories (stud or flock) on price, Selection Index, ADG Index, and on indexes of 'end of test' body measurements are presented.

Table 9: Analysis of Variance of breeder selection on Price[1], SI[2], ADG-I[3] and End mass index per intake.

Test intake	Breed Classification	Variables and means				
1997_1	**Category**	**PRICE[1]**	**SI[2]**	**ADG-I[3]**	**EM-I[4]**	**n**
	Flock	1469.61	104.07	115.57	99.78	51
	Stud	2916.67	104.68	119.03	101.89	6
	P[a]	*< 0.0001*	*0.8968*	*0.7991*	*0.6787*	
1998_2	**Category**	**PRICE[1]**	**SI[2]**	**ADG-I[3]**	**EM-I[4]**	
	Flock	2004.55	100.57	101.33	99.35	94
	Stud	3461.11	104.37	105.96	103.16	9
	P[a]	*< 0.0001*	*0.1436*	*0.3234*	*0.1767*	
2000_1	**Category**	**PRICE[1]**	**SI[2]**	**ADG-I[3]**	**EM-I[4]**	**n**
	Flock	2106.12	108.14	128.94	99.38	49
	Stud	4075.00	115.12	125.80	107.60	4
	P[a]	*< 0.0001*	*0.2716*	*0.8516*	*0.1680*	
2000_2	**Category**	**PRICE[1]**	**SI[2]**	**ADG-I[3]**	**EM-I[4]**	**n**
	Flock	2071.05	109.87	132.00	100.29	38
	Stud	3000.00	105.68	123.20	97.24	4
	P[a]	*< 0.0001*	*0.5297*	*0.6078*	*0.6327*	
2001_1	**Category**	**PRICE[1]**	**SI[2]**	**ADG-I[3]**	**EM-I[4]**	**n**
	Flock	1742.31	104.70	111.08	100.26	26
	Stud	4320.00	106.66	133.48	98.70	5
	P[a]	*< 0.0001*	*0.7077*	*0.0392*	*0.7648*	
2001_2	**Category**	**PRICE[1]**	**SI[2]**	**ADG-I[3]**	**EM-I[4]**	**n**
	Flock	1703.84	102.62	120.58	n/a	26
	Stud	4187.50	101.08	98.75	n/a	4
	P[a]	*< 0.0001*	*0.6608*	*0.1643*		

[1]-Ram price in Namibian dollars [2]-Selection Index [3]-Average Daily Gain Index
[4]-End Body Mass-Index [a] –probability n/a – data not available

From Table 9 it can be observed that Breed Classification category had a high significant influence on price in all years as were indicated in the previous tables. Although the means for the performance measurements (SI, ADG-I and EM-I) were larger for stud rams over flock rams in five of the six intakes analyzed, its influence

on these performance measurements (SI, ADG-I and EM-I) are however, not significant. This is in agreement with the results recorded by Terrill (1953:428) and Fourie (2000:131) where buyers paid higher prices for registered against unregistered rams, in spite of the fact that unregistered rams might have higher merit than shown by their average indexes.

This indicates that the emphasis placed on Breed Selection Category as indicator of performance excellence for the rams on the Veldram tests is not scientifically justified. It further shows that performance measurement standards set for rams to be classified as stud (ADG -index of 85 set for stud rams against 80 for flock rams) at Veldram tests, need to be revised.

4. CONCLUSION AND EXTENSION IMPLICATIONS

Buyers of rams at auctions consider several factors in the choice of a breeding ram to buy. Many factors undoubtedly affect the price that is paid for a ram at an auction other than the merit of the ram. The personalities and friendships of the buyers, as well as other psychological effects that cannot be measured, probably also affect their choice for rams. The contribution of available factors (model R^2) built into sale price models indicate their importance in decision making.

The findings in this paper agrees with earlier findings that performance does play a significant yet subordinate role in determining sale prices of rams. Although farmers did consider performance measurements in valuing rams, its contribution influencing ram sale price is still sub standard. The substantial contribution of Breed Category (according to Breed Standards) on auction prices for rams in the different years reveals the importance buyers of rams place on this factor as an indicator of a good breeding ram. This embedded perception may exert a strong force against change. Although USA authors recorded trends for progress in the use of performance data for ram selection (Lester, Notter & Mclure, 1983:47), no trend in the increased contribution of performance data to sale price has been observed for the tests done on Dorpers in Namibia or the RSA (Fourie, 2000:131). This indicates that the importance of scientific measurement of rams for genetic progress has not been established in the frame of reference of Dorper breeders. A long term concerted programmed approach by all stakeholders to establish this concept is necessary.

The fact that Stud rams did not perform better than flock rams in performance, indicates that stud breeders and the breed society need to re-examine norms and standards for Breed classification categories, considering the inclusion of breeding values in sale catalogues and classification standards. In an extension approach this data must form the base for convincing breeders to move towards scientific measurement. Progress may be quicker when new technologies are embedded into breeding standards, combining visual evaluation with measured performance. The testing of Dorper Veldrams has been discontinued in Namibia from 2003 following the withdrawal of the Ministry of Agriculture from the programme. Current regional and national Dorper ram auctions include no or only limited performance records,

indicating a danger for regression in the progress of scientific Dorper breeding in Namibia. The first step of recovery may be for tertiary institutions (Polytechnic or the University of Namibia -UNAM) to interact with the Dorper Breeder's Society of Namibia in re-instating performance measurement as an important move for advancing the Namibian Dorper flock to be globally competitative. A combined focus for change is necessary. If ram buyers exert influence on stud breeders to impart performance records, ram breeders will comply quicker. An extension approach that also focuses on educating commercial breeders, illuminating the advantage of performance tested rams for accelerated genetic improvement related to kilograms produced per hectare, adaptation and carcass quality is imperative.

At a workshop held in October 2004 to discuss a proposed Namibian National Small Stock Development Programme (NSSDP) with the industry, farmers indicated that they prefer an independent body such as the Government to supervise centralized tests, rather than individual or groups of farmers that execute the test themselves. Furthermore, it was also requested that more than one test station be established throughout the country to test ram performance within all the broad resource (ecological) areas. This expressed desire need to be acted on, and strengthened by the proposed initiators of the programme.

Progress with enrolment of performance testing/recording in neighbouring RSA with many Dorper breeders is also slow (Olivier & Cloete, 2006). Namibian breeders have a historic relation with Dorper breeders in the RSA and may therefore move at the pace of the RSA industry. The advancement of scientific breeding and the use of breeding values at sales of rams in the Merino breed may well become a catalyst for progress with RSA Dorper breeders and may be used to advantage in an extension programme as an influence for change in the Namibian Dorper industry.

It also needs to be emphasized that Veldram performance records, *in situ*, mainly evaluate the ram on growth and frame size. The biological implications of growth performance on end mass and feed intake need be considered (Groenewald, 1992; 47). The influence of reproduction on flock economics is of crucial importance (Neser, 1999; 28-33) and need to be made available for rams sold on Veldram auctions, disclosing the holistic breeding values on production and reproduction per ram auctioned.

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