

Influence of Age on Sexual Libido of Bull-Teasers in Dairy Cattle Herds

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ABSTRACT

Influence of age on sexual libido of bull-teasers was evaluated in dairy cattle herds at the Livestock Center "Triángulo 1" in Camagüey, Cuba. To this purpose, 140 Holstein x Zebu crossbred bull-teasers at ages from 13 to 75 months old were studied from 2007 to 2010. Sexual libido was evaluated as an age dependent variable by a linear regression model. Age ($39,76 \pm 19,89$ month-old standard deviation) showed a significant positive influence upon sexual libido ($6,59$ points $\pm 1,75$ standard deviation). Sexual libido increase with age was probably due to older bull-teasers' social rank and experience. Although bull-teasers younger than 24 months old showed an acceptable minimal sexual libido and could be fit for their role if rationally managed, some other factors like body build, management, environment, and age group must be assessed to this end.

Key Words: estrus detection, sexual performance, bulls, age

INTRODUCTION

Lindsay (1996), Parkinson (2004) and Galina, Horn and Molina (2007) have said that scientific literature is very contradictory concerning male sexual behavior, and not much is known to specify the ideal conditions for optimum yield.

Sexual libido is known in biology as the will and lust of a bull to attempt to mount a female (Landaeta-Hernández, Chenoweth and Berndtson, 2001), based on mating innate reflexes; Chenoweth (1981) proposed a scale (0-10 points) which has been widely accepted by the international scientific community. Bertram *et al.* (2002) developed it in *Bos taurus* as a procedure to identify bulls with structural and service problems; and also to classify their sexual behavior.

Several studies have been conducted in temperate areas regarding age and fertility, but only in males reserved for use as studs (Chenoweth, 1983; Farin, Chenoweth, Tomky, Ball and Pexton, 1989; Chenoweth, Chase, Thatcher, Wilcox and Larsen, 1996a; Landaeta-Hernández *et al.*, 2001; Chenoweth, 2004; Ellis *et al.*, 2005). However, in the tropical regions, there are not many studies on this topic; (Jiménez-Severiano, 2002); besides, in the province of Camagüey the teaser bulls with no genetic value (surgical phimosis) have limitations to complete mounting, which could result in failing to accomplish their important assignment. The purpose of this work is to

assess the effect of age on sexual libido of bovine teasers in Camagüeyan commercial herds.

MATERIALS AND METHODS

This research took place on farms with dairy herds, under artificial insemination schemes, at Triángulo 1 Cattle Enterprise in the province of Camagüey, from 2007 to 2010. One hundred and forty crossbred Holstein x Cebu teaser bulls used to stimulate estrus production as helpers to inseminators, were assessed. The bulls were 13-75 months old.

The teaser bulls grazed for a whole year, sometimes with the females (50); others did it at some specific times of the day (90). The male-female proportion did not exceed 1:30, considered as optimum by Holý (1987).

The libido measuring test was done by placing the teaser bulls for 30 min near the pen where the estrus females were, to induce erotization, following the method used by Bertram *et al.*, 2002. Later, they were allowed to contact for 10 min, according to the libido test for bulls (Chenoweth, 1981), and they were assessed using a 0-10 scale, shown in Table 1.

The teaser bulls were unable to penetrate the cows (complete service), because of surgical phimosis, but miming was interpreted as mounting, with typical beating on the kidney area. Age data were collected from each animal's record in the herd.

General statgraphs were calculated and the libido was assessed as an independent variable of age; then the best regression model adjustment was established (linear, logarithmic, inverse, quadratic, cubic, logistic and exponential), using SPSS, ver. 15.0.1 (2006).

RESULTS AND DISCUSSION

Table 2 shows the results from descriptive data analysis, where the mean libido reached 6.59 points \pm 1.751 (typical deviation); age was 39.76 \pm 19.895 (typical deviation).

In general terms, the mean libido values indicate that it is between good and very good (Chenoweth, 1981; Chenoweth, 1997) in spite of the phimosis. However, the teaser bull would just do one service, which, according to Araujo, Borgwardt, Sween, Yelich and Price (2003) allows for the detection of 96-100 % of estrus females. In that sense, a more intense libido is required to additionally stimulate estrus activity in the herd (Pérez-Hernández *et al.*, 2002; Fabre-Nys and Gelez, 2007; Roelofs *et al.*, 2007; Roelofs *et al.*, 2008), though inability of younger males has a remarkable influence. The mean teaser age was 39.76 months, in very heterogeneous age groups, (observed in typical deviation) as a result of different local handling practices (Loyola, 2004) under these conditions and also due to limited systematic possibilities to perform surgical phimosis.

Morgan and Dawson (2008) referred to teaser preparation in the field and suggested vasectomy and epididymectomy, which does not hinder mounting because the penis is introduced in the vagina; thus, the methodology used by Chenoweth (1981) can be applied. Several producers have said that surgical phimosis reduces, or at times causes libido suppression. The results achieved in this study show that libido endures time and tends to increase, also stated by Holý (1987).

The linear regression result was selected by the principle of moderation, which states that in models with similar results, the simpler one is used (Hair, Anderson, Tathan and Black, 1998). Table 3 shows that age has a significant effect on bull sexual libido, and the older the bull is, the more libido is experienced.

Mounting begins as early as two months old (Katz, 2007) and it does not depend entirely on hormonal activity in the gonads. Based on this

fact, at 13 months old, bulls can be used as teasers in the conditions of Camagüey, because they have a 4-point libido (minimum required for the category of good), similar to the one found by Chenoweth *et al.* (1996b) in 12.1 month-old animals, better than reports by López *et al.* (1999) of 3.2 points \pm 0,3 (SE) in the presence of the dominating bull, and 3.5 points \pm 0,4 (SE) in its absence. Therefore, it must be considered that these animals require a more limited use as teasers than the ones over 24 months old; additionally, their service capacity should be measured before inclusion, Landaeta-Hernández *et al.* (2001). Whether the use of heterogeneous or homogenous age groups is advantageous or not, should be investigated in Camagüeyan dairy cattle.

Along this research, libido was higher as teaser bull age increased, which may be explained by the social behavior established between the adult bulls in a herd, where the dominating animal inhibits sexual activity from the rest; even in the presence of the highest ranking male during the libido test. López *et al.* (1999) found in a social behavior study that young bulls are different in term of sexual dominance and, therefore, less susceptible to the presence of the dominating male, but not immune to its influence.

Moreover, the teaser bull expertise is important because its possibilities during the libido test are enhanced. Araujo, Borgwardt, Sween, Yelich and Price (2003) demonstrated that age has a positive effect in studs, because the adult bulls were able to mount a greater number of females than the young bulls used in the experiment. Price and Borgwardt (1994) —cited by López, Orihuela and Silva (1999) found no significant differences concerning sexual activity records in one or three year-old bulls. However, Silva-Mena, Ake-López and Delgado-León (2000) found a significant correlation ($r = 0.78$, $P < 0.01$) between the sexual libido (6.4 points \pm 0.5 (SEM)) and the bull age. Albarrán, González-Rubiera and Calderón (2001) observed that the highest reproductive capacity is achieved between 4-7 years.

Generally, libido appeared in its lowest acceptable value in younger animals, thus limiting their use as teasers, because high libido is critical to achieve their goal. Consequently, another study would help determine the best level for optimum use of estrus detection as an auxiliary method and a biological stimulator (Pérez-Hernández, García-

Winder and Gallegos-Sánchez, 2002; Berardinelli, Joshi and Tauck, 2007; Roelofs, Soede, Voskamp-Harkema, Kemp and Arteaga, 2008).

CONCLUSIONS

Sexual libido significantly increased with teaser age, maybe due to the social behavior and sexual activity features at different ages. However, they can be used in animals 13 months old and over, because their libido is acceptable to achieve their goal. Other effects like body condition and access to female herds should be analyzed.

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REFERENCES

- ALBARRÁN, I.; GONZÁLEZ-RUBIERA, E. y CALDERÓN, R. (2001). *Inseminación artificial y andrología veterinaria* (tomo 1). La Habana, Cuba: Editorial Félix Varela.
- BERARDINELLI, J. G.; JOSHI, P. S. y TAUCK, S. A. (2007). Conception rates to artificial insemination in primiparous, suckled cows exposed to the biostimulatory effect of bulls before and during a gonadotropin-releasing hormone-based estrus synchronization protocol. *Journal Animal Science*, 85, 848-852.
- BERTRAM, J. D.; FORDYCE, G.; MCGOWAN, M. R.; JAYAWARDHANA, G. A.; FITZPATRICK, L. A.; DOOGAN, V. J. *et al.* (2002). Bull selection and use in northern Australia. 3. Serving capacity tests. *Anim Reprod Sci*, 71 (1-2), 51-66.
- CHENOWETH, P. J. (1997). Bull libido/serving capacity. *Vet Clin North Am Food Anim Pract*, 13 (2), 331-344.
- CHENOWETH, P. J. (1981). Libido and mating behavior in bulls, boars and rams. A review. *Theriogenology*, 16 (2), 155-177.
- CHENOWETH, P. J. (1983). Sexual behavior of the bull: a review. *J Dairy Sci*, 66 (1), 173-179.
- CHENOWETH, P. J. (2004). Evaluation of natural service bulls-the "other" BSE. *Vet J*, 168 (3), 211-212.
- CHENOWETH, P. J.; CHASE, C. C.; THATCHER, M. J.; WILCOX, C. J. y LARSEN, R. E. (1996a). Breed and other effects on reproductive traits and breeding soundness categorization in young beef bulls in Florida. *Theriogenology*, 46 (7), 1159-1170.
- CHENOWETH, P. J.; CHASE, C. C.; LARSEN, R. E.; THATCHER, M. J. D.; BIVENS, J. F.; y WILCOX, C. J. (1996b). The assessment of sexual performance in young *Bos taurus* and *Bos indicus* beef bulls. *Applied Animal Behavior Science*, 48, 225-236.
- DE ARAUJO, J. W.; BORGWARDT, R. E.; SWEEN, M. L.; YELICH, J. V. y PRICE, E. O. (2003). Incidence of repeat-breeding among Angus bulls (*Bos taurus*) differing in sexual performance. *Applied Animal Behavior Science*, 81, 89-98.
- DE LOYOLA, C. J. (2004). *Evaluación de la calidad de la detección del celo en rebaños bovinos lecheros en condiciones de Camagüey*. Tesis en opción al Título de Máster en Producción Bovina Sostenible, Universidad de Camagüey, Camagüey, Cuba.
- ELLIS, R. W.; RUPP, G. P.; CHENOWETH, P. J.; CUNDIFF, L. V.; LUNSTRA, D. D. y CHASE, C. C. (2005). Fertility of yearling beef bulls during mating. *Theriogenology*, 64, 657-678.
- FABRE-NYS, C. y GELEZ, H. (2007). Sexual behavior in ewes and other domestic ruminants. *Hormones and Behavior*, 52, 18-25.
- FARIN, P. W.; CHENOWETH, P. J.; TOMKY, D. F.; BALL, L. y PEXTON, J. E. (1989). Breeding soundness, libido and performance of beef bulls mated to estrus synchronized females. *Theriogenology*, 32 (5), 717-725.
- GALINA, C. S.; HORN, M. M. y MOLINA, R. (2007). Reproductive behavior in bulls raised under tropical and subtropical conditions. *Horm Behav*, 52 (1), 26-31.
- HAIR, J. F.; ANDERSON, R. E.; TATHAN, R. E. y BLACK, W. C. (1998). *Análisis multivariante* (5^a ed.). PRENTICE HALL IBERIA, S. R. L.
- HOLY, L. (1987). *Biología de la reproducción bovina*. La Habana, Cuba: Editorial Científico Técnica.
- JIMÉNEZ-SEVERIANO, H. (2002). Sexual development of dairy bulls in the Mexican tropics. *Theriogenology*, 58, 921-932.
- KATZ, L. S. (2007). Sexual behavior of domesticated ruminants. *Hormones and Behavior*, 52, 56-63.
- LANDAETA-HERNÁNDEZ, A. J.; CHENOWETH, P. J. y BERNDTSON, W. E. (2001). Assessing sex-drive in young *Bos taurus* bulls. *Animal Reproduction Science*, 66, 151-160.
- LINDSAY, D. R. (1996). Environment and reproductive behavior. *Animal Reproduction Science*, 42, 1-12.
- LÓPEZ, H.; ORIHUELA, A. y SILVA, E. (1999). Effect of the presence of a dominant bull on performance of two age group bulls in libido tests. *Applied Animal Behavior Science*, 65, 13-20.
- MORGAN, G. L. y DAWSON, L. J. (2008). Development of teaser bulls under field conditions. *Vet Clin North Am Food Anim Pract*, 24 (3), 443-453.
- PARKINSON, T. J. (2004). Evaluation of fertility and infertility in natural service bulls. *Vet. J.*, 168 (3), 215-229.
- PÉREZ-HERNÁNDEZ, P.; GARCÍA-WINDER, M. y GALLEGOS-SÁNCHEZ, J. (2002). Bull exposure and an increased within-day milking to suckling inter-

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val reduced postpartum anoestrus in dual purpose cows. *Anim Reprod Sci*, 74 (3-4), 111-119.

ROELOFS, J. B.; SOEDE, N. M.; DIELEMAN, S. J.; VOSKAMP-HARKEMA, W.; KEMP, B. y BARTH, A. D. (2007). The acute effect of bull presence on plasma profiles of luteinizing hormone in postpartum, anoestrous dairy cows. *Theriogenology*, 68, 902-907.

ROELOFS, J. B.; SOEDE, N. M.; VOSKAMP-HARKEMA, W.; KEMP, B. y ARTEAGA, A. A. (2008). The effect of fenceline bull exposure on expression of oestrus in dairy cows. *Animal Reproduction Science*, 108, 226-235.

SILVA-MENA, C.; AKE-LÓPEZ, R. y DELGADO-LEÓN, R. (2000). Sexual behavior and pregnancy rate of *Bos indicus* bulls. *Theriogenology*, 53 (4), 991-1002.

SPSS (2006). SPSS 15.0 para Windows (Version 15.0.1): SPSS (c) inc., 1989-2006.

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Table 1. Sexual libido classification scale in bulls (Chenoweth, 1981)

Points	Attitude
0	The bull is not aroused
1	The bull was aroused only once
2	Positive sexual interest in the female more than once
3	Active attention to the female with persistent sexual interest.
4	One mount or attempt of mount, without service.
5	Two mounts or attempt of mount without service
6	More than two mounts or attempt of mounts without service
7	One service without persistent sexual interest.
8	One service followed by sexual interest with mounting or attempt of mounting.
9	Two services without persistent sexual interest.
10	Two services followed by sexual interest, mounting attempt, or service.

0-3, the bull classifies as bad; 4-6, the bull classifies as good; 7-8, the bull classifies as very good; 9-10, the bull classifies as excellent

Table 2. Descriptive statistics of sexual libido and teaser age

	N	Minimum	Maximum	Mean	Typical deviation
Sexual libido	140	3	10	6.59	1.75
Teaser age	140	13	75	39.76	19.89

Table 3. Summary of model and estimations of libido parameters as dependent variable of teaser age

Model	Non-standardized models		Standardized coefficients	t	Sig.
	B	Typical error	Beta		
1	(Constant)	3.71	.19	19.53	.000
	Teaser age	.07	.004	.82	.000

Dependent variable: sexual libido