

SEMEN QUALITY OF ARRABI AND KARRADI IRAQI RAMS .

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ABSTRACT

Breed differences in the semen quality of Iraqi sheep were studied on 16 rams, 8 of each, Karradi and Arrabi. Rams were habituated on the method of electrical stimulation with a bi-polar rectal probe. Semen samples were collected within two weeks and their characters which included, volume of ejaculate, color, pH, mass motility percentage , individual motility percentage, concentration of sperm , viability percentage, abnormal sperm percentage and acrosomal abrasion percentage were tested for both Karradi and Arrabi breeds. The results revealed that the volume 0.61ml, 0.59 ml, color degree 1.25, 1.5, pH 6.89, 6.9, mass motility 66.25% , 63.75%, individual motility 60%, 58.75%, sperm concentration 121.88 million/ml, 120.5 million/ml, viability 74%, 70.25%, abnormal sperm 17.13% , 18% and acrosomal abrasion 18.5% , 19.25 respectively . Karradi ram semen showed higher viability percentage 74 ± 1.3 than that in Arrabi 70.23 ± 0.56 , and it is highly significance ($p < 0.01$). Karradi sheep in general may have been adapted and acclimatized exceptional well in the middle part of Iraq compared to Arrabi sheep.

Key word: Arrabi Ram, Karradi Ram, Semen quality.

INTRODUCTION

The reproductive activity of sheep especially that which deals with reproductive performance of rams has been studied by many workers ,Van Niekerk and Van Niekerk, (1989); Toe, et. al., (1994); Sarlos and Molnar, (1995); Ollero, et. al., (1996); Ibrahim, (1997). The associations between the breed of rams and their semen quality have been evaluated by many researchers in different parts of the world (Abdel-Rahman, et. al., (2000); Rege, et. al., (2000); Gundogan and Demirici, (2003); Salhab, et. al., (2003); Snowden, et. al., (2002), David, et. al., (2007) and Dominguez, et. al., (2008).

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In Iraq there are 3 important breeds of sheep available namely the Awassi, Karradi and Arrabi. Whilst the study of the seminal quality has been conducted on selected Iraqi (Zukri, 2005) and Awassi rams (Al-Samarrae, 2006), there is no report on the seminal quality of the Karradi and Arrabi breeds.

MATERIALS AND METHODS

This study was conducted in middle part of Iraq / Diyala, to examine the effect of breed of sheep on the reproductive activity of rams. During breeding season). 16 rams two years aged, 8 of each breed, Karradi and Arrabi were habituated on the method of electrical stimulation with a bi-polar rectal probe (Cameron, 1977). After that, semen samples were collected from rams twice weekly within a period of 14 days from 14th to 28th September 2007. Furthermore, they were under unified nutritional system.

Criteria of semen quality

The semen characters which have been studied depending on the following criterion as a basis for qualifying semen quality, volume of ejaculate in ml, color, evaluated instantaneously and given four degrees beginning from creamy color ending in plasma like color, pH, mass motility percentage, individual motility percentage, concentration of sperm in million/ml, viability percentage, abnormal sperm percentage and acrosomal abrasion percentage. Mass motility concedes according to Evans and Maxwell (1987). Individual motility estimated according to Walton (1933), which was clarified by Chemineau (1991). Sperm consideration according to Salisbury (1943) which was clarified by Mohan, et. al. (1980). viability of sperm percentage considered according to Blom (1950), which was clarified by Chemineau (1991). Sperm abnormality percentage according to Blom (1950). Acrosomal abrasion percentage considered according to Watson and Martin(1971).

Statistical analysis

The “ T “ test statistical analysis were used to differentiate between the two groups .

RESULTS

In general the seminal characteristic of Karradi is superior than Arrabi in the aspect of volume, mass motility, individual motility, sperm concentration and viability. Of these parameters, only the viability of the Karradi ram semen is found to be significantly higher than Arrabi breed ($P < 0.10$). In addition to that, although

it was not significant, Karradi semen showed less semen abnormality and abrasion compared to Arrabi semen.

Table 1. Comparison on the semen parameters between Karradi and Arrabi breed .

Parameters	Karradi	Arrabi	Significance level
Volume (ml)	0.61±0.03	0.59±0.03	–
Color	1.25±0.16	1.5±0.18	–
pH	6.89± 0.06	6.9± 0.04	–
Mass motility %	66.25± 2.45	63.75± 2.45	–
Individual motility%	60±1.89	58.75± 2.79	–
Sperm concen. million/ml	121.88± 0.58	120.5± 0.27	–
Viability %	74.0± 1.3	70.25± 0.56	P < 0.01
Abnormal sperm %	17.13± 0.72	18± 0.68	–
Sperm abrasion %	18.5± 0.71	19.25± 0.41	–

- *Not significant*

DISCUSSION

This study was able to demonstrated that the percentage of semen viability of Karradi breed is significantly higher compared to Arrabi breed. The superiority of Karradi semen parameters have also been reported by other researchers but the they are not able to show any significant different (Zukry, 2005; Al-Samarrae, 2006).

The Karradi sperm concentration showed higher percentage in comparison to that of Arrabi and may reach a significant level if the sample size is increased.

The results of this study showed that the semen parameters of the two breeds were different from that obtained by Zukry (2005) and Al-Samarrae (2006). The data revealed the presence of variances between the three breeds especially between Karradi and Arrabi, and the Awassi. The semen quality of the latter breed was reported to be significantly higher in mass and individual motility of sperms.

Such differences may be attributed by many factors that can affect the semen quality such as genetic and environmental changes (Salrose and Molnar, 1995; Abdel-Rahman et al., 2000; Rege et al., 2000; Gundogan et. al., 2004), nutritional and physical (Colas, 1981; Toe et al., 1994) and seasonal variation (Ibrahim, 1997; Rege et al., 2000). Some workers found that the volume of ejaculate, motility and semen concentration appeared to be higher in autumn than those in the other seasons of the year (Gundogan and Demirci, 2003; Salhab et al., 2003). Dominguez et al. (2008) proved that seminal plasma (sp) collected from rams during autumn and winter had an increased sperm motility ($p < 0.05$), whereas such increases was not observed during spring or summer. Nutritional factor such as copper deficiency had negative effect on the semen parameters (Van Niekerk and Van Niekerk, 1989). Gundogan et al. (2004) proved that there was a high correlation factor ($p < 0.01$) between level of serum protein and semen motility, whereby this finding had been used as a basis in determining the quality of the reproductive performance of rams.

The present study support previous finding that quality semen parameters could be obtained during autumn (Gundogan and Demirci, 2003; Salhab et al., 2003) as the study was carried out in autumn. Furthermore, Karradi semen parameters appeared superior then that of Arrabi and this may be attributed to genetic variations as pointed by Gundogan, et. al. (2004). This study showed that Karradi sheep in general may have adapted and acclimatized exceptional well in the middle part of Iraq compared to Arrabi sheep.

REFERENCES

- Abdel-Rahman, H.A. , M. S. Belely, A. A. Al-Qarawi and S. A. El-mougy.2000. The relationship between semen quality and mineral composition of semen in various ram breed . *Small Rumin. Res.* ; 38(1):45-49 .
- Al-Samarrae, S.H. 2006. Potentiality employment of some hematological and biochemical criteria for evaluation of productivity performance traits of Iraqi sheep . Ph.D. Thesis, University of Baghdad .
- Blom, E. 1950. A simple staining method for differentiation between live and dead sperm cells by means of eosin and nigrosin. *Nord.Vet.Med.* 2:58-62.

- Cameron, R.D. 1977. Semen collection and evaluation in the ram. The effect of method of stimulation on response to electro ejaculation . Aust. Vet. J. ; 53 (8) : 380-383 .
- Chemineau, P., Y. Cogine, P. Orgeure, and J. Valtet.1991. Training Manual on Artificial Insemination in Sheep and Goats . FAO , Animal Production and Health paper ; 83 : 117-119 .
- Colas, G. 1981. [Seasonal variations of sperm quality in adult Ile-de-France rams . II. Fertilization ability and its relation to qualitative criteria in vitro] . Reprod. Nutr. Dev. ; 21(3):399-407 .
- David, I. , L. Bodin, G. Lagriffoul, E. Manfredi and C. Robert-Granie .2007. Character process model for semen volume in AI rams : evaluation of correlation structures for long and short-term environmental effects . Genet. Sel. Evol. ; 39(1):55-71 .
- Dominguez, M.P., A. Falcinelli, F. Hozbor, E. Sanchez, A. Cesari and R. H. Alberio. 2008. Seasonal variations in the composition of ram seminal plasma and its effect on frozen-thawed ram sperm . Theriogenology ; 69(5):564-73 .
- Evans, G. and W.M. C. Maxwell.1987. Salamones Artificial Insemination of Sheep and Goats. Buffer worth. Sydney . Australia, Pp:1-194
- Gundogan, M. and F. Demirci.2003. Monthly changes in some reproductive parameters and in testosterone and thyroxin values of rams throughout one year under continental climate conditions. Dtsch. Tieraztl. Wochenschr.; 110(11):450-3.
- Gundogan, M., D. Yeni and E. Ozenc . 2004. Relationship between some reproductive parameters and biochemical properties of blood serum in Ram. Arch.Androl.; 50(6):387-390.
- Ibrahim, S.A. 1997. Seasonal variations in semen quality of local and crossbred raised in the United Arab Emirates. Anim. Reprod. Sci. ; 49(2-3):161-7 .
- Lymberopoulos, A. G. , I. A. Tsakmakidis and T. A. Khalifa .2008. Effect of Ram age on structural and functional competence of frozen-thawed spermatozoa in dairy sheep. Reprod. Domest. Anim. (Epub ahead of print).
- Mohan, O., N. K. Mazumder and N. K. Gooswami .1980. Note on semen characteristics in Indian Pashmina goats. Ind. J. Anim. Sci.; 50:898-900.
- Ollero, M. , T. Muino-Blanco, M. J. Lopez and J. A. Cebrian-Perez .1996. Viability of ram spermatozoa in relation to the abstinence period and successive ejaculation . Int. J. Androl. ; 19(5):287-92 .

- Rege, J.E. , F. Toel, E. Mukasa-Mugerwa, S. Tembely, D. Amindo, R. L. Baker and A. Lahlou-Kassi .2000. Reproductive characteristics of Ethiopian highland sheep . II. Genetic parameters of semen characteristics and their relationships with testicular measurements in ram lambs . Small Rumin. Res. ; 37(3):173-187 .
- Salhab, S.A. , M. Zarkawi, M. F. wardeh, M. R. Al-Masri and R. Kassem .2003. Characterization and evaluation of semen in growing Awassi ram lambs . Trop. Anim. Health prod. ; 35(5):455-63 .
- Salisbury, G.W., I. Beek and E. L. Willet .1943. Rapid method of estimating number of spermatozoa in Bull semen. J.Diary Sci.; 26:483-488. (cited by Zukri, 2005).
- Sarlos, P. and A. Molnar .1995 . Seasonal changes in sperm parameter of British milk ram . Acta. Vet. Hung. ; 43(2-3):247-57 .
- Snowder, G.D. , J. N. Stellflug , and L. D.Van Vleck .2002. Habitability and repeatability of sexual performance scores of rams. Anim. Sci.; 80(6)1508-11 .
- Toe, F. , A. Lahlou-Kassi and E. Mukasa-Mugerwa .1994. Semen characteristics of Ile-de-France rams of different age and physical condition . Theriogenology ; 42(2):321-6 .
- Van Niekerk, F.E. and C. H. Van Niekerk .1989. The influence of experimentally induced copper deficiency on the fertility of rams. I. Semen parameters and peripheral plasma androgen concentration. J. Sci. Vet. Assoc. 60(1):28-31.
- Walton, A. 1933 . The Technique of Artificial insemination . Edinburgh imperial Bureau . Animal genetic 56, ILius- Edinburgh . (cited by Zukry 2005).
- Watson, P.F. and I. C. Martin .1971. A comparison of changes in the acrosomes of deep frozen ram and bull spermatozoa. J. Reprod. Fert.; 28 : 55-59 .
- Zukri,A.M.M. 2005. The effective of vitamin H and HCG hormone on the reproductive activity of Awasi rams sheep. M.Sc.Thesis, College of Veterinary Medicicne, Baghdad, Iraq.

نوعية السائل المنوي في كباش الكرادي والعراقي العراقية .

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الخلاصة

تم دراسة التباين بين خصائص السائل المنوي في كباش الكرادي والعراقي العراقية ، وبعد تعويد الكباش على جهاز التحفيز الكهربائي تم جمع السائل المنوي خلال فترة لا تتجاوز الأسبوعين واشتملت الدراسة على حجم القذفة و اللون و الأس الهيدروجيني و الحركة الجماعية و الحركة الفردية و تركيز النطف و نسبة النطف الحية و المشوهة و تشوه الاكروسوم ؛ وقد كانت معدلات القراءات الخاصة بالسائل المنوي في كباش الكرادي حيث كانت حجم القذفة ٠.٦١ سم^٣ ، و درجة اللون ١.٢٥ و الأس الهيدروجيني 6.89 و الحركة الجماعية ٦٦.٢٥% والحركة الفردية 6٠% تركيز النطف ١٢١.٨٨ مليون/سم^٢ ونسبة النطف الحية 74% و نسبة النطف المشوهة ١٧.١٣% و نسبة تشوه الاكروسوم ١٨.٥%. أما في كباش العراقي فقد بلغت هذه القيم ٠.٥٩ سم^٣ ، ١.٥ ، 6.9 ، ٦٣.٧٥% ، ٥٨.٧٥% ، ١٢٠.٥ مليون/سم^٢ ، ٧٠.٢٥% ، ١٨% و ١٩.٢٥% وعلى التوالي . أظهرت الكباش الكرادي نسبة نطف حية أعلى مما موجود في الكباش العراقي $p < 0.01$ ، وبصورة عامة يمكن القول بأن الكباش الكرادي ربما تكون أكثر إمكانية للتأقلم من العراقي للعيش والتكاثر في المنطقة الوسطى .