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DEDICATION

*I dedicate this work to my beloved mother Halima Ali and
my late father Mohammed Driff*

*To the naughty and sought to comfort and contentment
blessed who did not spare something for a batch in the
way of success, which taught me that elevated him to life
with wisdom and patience to my dear father Mohammed
Edriss, brothers and sisters who were at my side to add
courage, and special mention of them Khalid and Abdalla
Driff*

*To the soul Sadam Hakeen who gave every effort to
ensure the success of this work, and to all the good
people wherever they are and however they i dedicate
this work*

Fatima

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ABSTRACT

This research was conducted to scrutinize phenotypic and
.genotypic characterization of Erashy cattle
Hindered twenty Questionnaire (120 forms) was used to
evaluate performance of Erashy cattle herd under village
condition in March to August 2010. At north Delta El-gash
locality in order to give a detailed picture of the Erashy
cattle type and the production system under which it
performs. The data were analyzed by Statistical Package
. (for Social Sciences (SPSS

The results revealed that (86.7%) of the respondents
claimed that natural pasture is not available. Majority of

animal owners indicated that there is a lack of potable water and mal-distribution of its points especially in the summer. Breeding method was natural service (100%). Percentage (off-take) withdrawn from each herd is weak(4%).The majority of the respondents (80%) indicated that the age of puberty of Erashy cattle was 4 years, the age at first calving was 5 years, gestation length was(285days), first post-calving oestrus (90 days); calving interval was 1-3years. (56.7%) of the respondents said, the fertility is medium. (60.8%) of respondents reported that lactation period of Erashy cattle type was 180 days. (28.3%) of animal owners indicated that the total milk yield per lactation period of Erashy cattle type under field condition was800Kg. (44.2%) of animal owners explained that daily milk yield of Erashy cattle was .((5.3Kg). Illiteracy is a major problem in the area (83.5% Body measurements data were done for fifty one cows divided into three groups on the basis of number of calving. Data was analyzed by using completely randomized design to compute analysis of variance. For meaningful comparison, least significant difference (LSD) test were performed. Analysis of variance revealed that there were no significant differences among animals under this study except some of them, like Heart girth and Pelvic width at significant differences ($P<0.05$). The overall averages of body measurements (cm) as height at withers, heart girth, barrel circumference, chest depth, chest skin sickness, back length, pelvic width, neck length, body length, ear length , horn length, face length,

tail length, anterior udder length, posterior udder length, udder base length, cranial teats length, caudal teats length, pin bone width, dewlap depth, height at rump, neck skin thickness, body weight were 123.4, 149.0, 203.1, 58.3, 0.58, 63.24, 34.4, 33.39, 138.43, 22.60, 20.55, 47.89, 89.33, 10.08, 16.76, 19.58, 4.53, 4.53, 14.00, .14.06, 130.78, 0.56cm and 269.67kg respectively

Animal's conformation data were collected from 118 mature cows. The coat colors of the cattle were white, bright red brown, and multi-color, and represented 63%, 5% and 32% respectively. Black eyes, black eyelids, white eyelids, brown eyelids, white eyelashes, black eyelashes, black tip hair, brown hoof, black hoof, brown muzzle, black muzzle, represented (95%), 54%, 33%, 13%, 68.6%, 31.4%, 70%, 40.7%, 59.3%, 40% and 60% respectively.

Dewlap is well developed in all studied animals and goes down in front of the forelegs forming few folds, and it is predominant in both sexes. Hump extended in male and restricted in female, and may be cervical or cervico-thoracic. The basic temperaments of the animals concerned were docile and aggressive.

The experiment was carried to assess the effect of feed level in some productive and reproductive performance at the Department of Animal Production - Faculty of Agriculture and Natural Resources - (New Halfa) - Kassala University - October 2010 to October, 2011.

In this trial twenty heifers in age 3-3.5 years old (settle heifers) in white color (which are assumed to be pure

Erashy) as revealed in order to obtain baseline data. The animals were divided into four groups according to the diet levels. The analyzed data revealed that the dietary level of concentrate had Significant effect ($p \leq 0.05$) on performance of experimental heifers regarding, feed intake, average growth rate, bi-weekly weight gain, total body weight gain(kg), final body weight(kg), and feed .conversion efficiency

The results indicated that the diet level had significant effect on the heifer's onset puberty. Results showed strong negative correlations between age at puberty and body weight (-0.206). Diet levels effect on successful .conception occurrence

Genotypic characterization of Erashy cattle type and to assess their relationship with other breeds, at Department of Biology-Central Laboratory-Ministry of Science and Communication. The RAPD-PCR method was performed on blood samples taken from 75 animals, (25 from each of the three breeds namely Erashy, Kenana and Butana). Six arbitrary 10-mer primers were used to detect the DNA polymorphisms in the whole genome and filter paper .samples

Two hundred and twenty nine fragments were amplified using six primers. The average of genetic distances among three cattle breeds which calculated according to the RAPD bands obtained with six primers ranged from(0.59 -0.64). According to the dendrogram and cluster analysis of RAPD data the results from the phylogenetic analysis indicated that the populations of Erashy cattle breed is

more genetically closer to the population of Butana cattle
.breed than to population of Kenana cattle breeds
The conclusion of this study indicated that Erashy cattle
may be sub-type of Butana cattle. Such high level of
genetic differentiation within the Sudanese cattle
population leads to the speculation that they might belong
to different breeds despite their having the same name
and similar morphological traits. This recommended that
genetic characterization of these cattle needs to be
clarified in the future by more specific molecular
.techniques

مستخلص البحث

أجري هذا البحث بهدف دراسة الخصائص المظهرية و الوراثةية لأبقار الايراشاي بشرق السودان.

تم توزيع مائة وعشرين استمارة استبيان لملاك الحيوان (مارس- أغسطس 2010)، في محلية شمال دلتا القاش بغرض دراسة الأداء الإنتاجي والتناسلي لأبقار الايراشاي في بيئتها المحلية. البيانات المرصودة ((SPSS تم تحليلها بواسطة برنامج الحزم الإحصائية للعلوم الاجتماعية).

أظهرت نتائج المسح الميداني أن أبقار الايراشاي هي الخيار الأول للمربين بنسبة (94.2%)، نظام الرعي السائد بالمنطقة هو النظام الرعوي التقليدي بشقيه المستقر (20%) والمترحل داخل وخارج منطقة مشروع دلتا القاش الزراعي (80%). أشار غالبية الملاك إلى أن هناك نقصا في المياه الصالحة للشرب مع سوء توزيع نقاط المياه خاصة في فصل الصيف. بينت النتائج ضعف الوعي بأهمية المعاملات اللازمة إتباعها أثناء عملية الحلب وكيفية التعامل مع الحليب، المسحوب السنوي من قطيع الأبقار بمنطقة القاش ضعيف جدا (4%). أشار (80%) من المربين أن عمر البلوغ الجنسي لماشية الايراشاي 4 سنوات. العمر عند أول ولادة 5 سنوات. فترة الحمل (285 يوم)، أول شبق بعد الولادة 90 يوم، الفترة بين الولادات (1-3 سنة). أوضح (56.7%) من اللذين تم استبانهم أن أبقار الايراشاي متوسطة الخصوبة. أشار (58.3%) من اللذين تم استبانهم أن الإجهاض هو المرض الأول و الأكثر أهمية

بالمنطقة. أوضح (60.8%) من المستهدفين أن طول موسم الإدرار لأبقار الايراشاي 180 يوم. قدرت كمية الحليب خلال موسم الإدرار لدى (28.3%) من المربين بنحو 800 كجم تحت ظروف المرعى الطبيعي. أوضح (44.2%) من المربين أن كمية الحليب المنتج خلال اليوم الواحد حوالي 5.3 كجم باليوم. أوضح (44.2%) من المربين أن العمر الإنتاجي لأبقار الايراشاي من الحليب عشرة سنوات حيث تلد البقرة الواحدة في القاش في أفضل حالاتها 5 ولدات في العمر. الأمية هي المشكلة (%الرئيسة بالمنطقة (84).

أجريت قياسات الجسم لإحدى وخمسين بقرة في الفترة من 22/2/2011 حتى 28/3/2011 وزعت إلى ثلاث مجموعات على أساس عدد الولادات. صممت التجربة باستخدام التصميم العشوائي الكامل, ثم حلت البيانات إحصائياً لحساب التباين لمقارنة الفروق على اقل مستوى من المعنوية. كشف تحليل التباين عن عدم وجود فروق ذات دلالة إحصائية بين الحيوانات تحت هذه الدراسة ما عدا بعض قياسات الجسم, المتوسط ($p \leq 0.05$) (محيط الصدر, عرض الحوض) عند مستوى معنوية العام لمقاييس الجسم (سنتيمتر) كارتفاع الحارك, محيط الصدر, محيط البطن, عمق الصدر, سمك جلد الصدر, طول الظهر, عرض منطقة الحوض, طول (الرقبة, الجسم, الأذن, القرن, الوجه, الذيل, الضرع الأمامي, الضرع الخلفي, قاعدة الضرع, الحلمة الأمامية, الحلمة الخلفية), عرض العظمة الدبوسية, عمق اللب, ارتفاع منطقة الكفل, سمك الجلد . . , 63.24 , 0.58 , 58.3 , 203.1 , 0. ووزن الجسم على التوالي: 123.4 , 149 , 34.4 , 19.58 , 16.76 , 10.08 , 89.33 , 47.89 , 20.55 , 22.60 , 138.43 , 33.39 , 34.4 , 4.53 , 4.53 , 14.00 , 14.06 , 130.78.0.56 كجم 269.67 و.

بيانات الصفات الشكلية لأبقار الايراشاي تم جمعها من عدد 118 بقرة ناضجة. أوضحت نتائج الدراسة وجود ألوان متباينة لأبقار الايراشاي واللون السائد هو الأبيض بنسبة (63%)، اللون الأحمر بني بنسبة (5%) و متعددة الألوان بنسبة (32%). اللون الأسود لا يوجد إطلاقاً. العيون لونها اسود بنسبة (95%). لون جفن العين اسود بنسبة (54%)، ابيض بنسبة (33%)

بني بنسبة (13%)، لون الرموش ابيض بنسبة (68%)، اسود بنسبة (32%) لون Tip hair. لون الحافر اسود بنسبة (70%) واسود بنسبة (30%) لون Tip hair. لون المخطم اسود بنسبة (60%) وبني بنسبة (40%). الغيب متطور وممتد من الإمام إلى الخلف مع قلة طياته وهو سائد في الجنسين. أوضحت الدراسة إن السلالات النقية هادئة الطباع وسهلة الانقياد على عكس الهجين منها.

أجريت تجربة تقويم الأداء الإنتاجي والتناسلي لأبقار الايراشاي بمزرعة الإنتاج الحيواني - كلية الزراعة والموارد الطبيعية - جامعة كسلا (حلفا الجديدة) في الفترة من أكتوبر 2010 حتى أكتوبر 2011. لمعرفة اثر التغذية على الأداء الإنتاجي و التناسلي لعجلات أبقار الايراشاي. لهذا الغرض جلب عدد عشرون عجلة بعمر (3-3.5) سنة، قسمت عشوائيا إلى أربعة مجموعات متساوية، تم تغذيتها بعلائق تختلف في مستويات الطاقة لمعاملات ($P \leq 0.05$) والبروتين. أظهرت الدراسة وجود أثرا معنويا للعلائق على استهلاك الغذاء اليومي، زيادة الوزن الحي كل أسبوعين، معدل النمو اليومي، الوزن المكتسب خلال فترة التجربة، الوزن الكلى و تحسين الكفاءة التحويلية بزيادة نسبة المواد المركزة في العليقة على التوالي.

لمعاملات العلائق - ($P \leq 0.05$) نتائج الدراسة دلت على وجود اثر معنوي حسب مستويات التغذية المختلفة- على ظهور علامات البلوغ الجنسي. أظهرت الدراسة وجود علاقة ارتباط طردية قوية سالبة (-0.206) بين الوزن والعمر عند البلوغ هذا يعنى أن سوء التغذية يؤخر سن البلوغ الجنسي بشكل ملحوظ. تشير نتائج الدراسة إلى أن نجاح الإخصاب الملقح في الحيوانات المعنية يتأثر بتركيز العليقة المقدمة للحيوان.

أجرى البحث في المعمل المركزي -الوحدة الجزيئية - قسم علم الأحياء وعلم المناعة- وزارة العلوم والاتصالات -السودان. بغرض التوصيف الوراثي لأبقار الايراشاي، دراسة العلاقة و التباينات الوراثية وتحديد البصمة لعدد ثلاث سلالات من الماشية المحلية السودانية ((الاييراشاي، كنانة وبطانة)).

استخدمت ستة بادئات عشوائية لدراسة التفاعل التضاعفي لقطع سلسلة DNA-الحمض النووي في هذه السلالات للكشف عن الأشكال المتعددة ل الجينوم كله (عدد 75 عينة دم، 25 عينة دم لكل سلالة) باستخدام مؤشر التفاعل العشوائي متعدد الأشكال (RAPD) (الواسم الجزيئي DNA) لسلسلة الدنا.

أظهرت نتائج التجربة عدد مائتان تسعة وعشرون (229) قطعة متضاعفة RAPD (حزمة) من سلسلة الدنا. استخدمت المعلومات الناتجة من تقنية لتقدير البعد الوراثي والعلاقة بين أفراد السلالة الواحدة و السلالات الأخرى باستخدام معامل التشابه استنادا على طريقة

ورسم شجرة النسب مبنيا على التشابه (Nei and Li, 1979) وفقا ((Dendrogram)) الوراثي و مستخدما مخطط التحليل التجميعي تراوحت درجة التشابه الوراثي. (UPGMA cluster analysis) لطريقة بين السلالات الثلاث من (0.59-0.64) بمعدل 0.615 . معدل قيم البعد الوراثي بين أفراد السلالة الواحدة (ايراشاي، كنانة وبطانة) كان على النحو التالي 0.81%، 0.73% و 78% على التوالي . من استخدام مخطط التحليل التجميعي المبني على قيم البعد الوراثي واستخدام طريقة في رسم شجرة نسب RAPD من المعلومات الخاصة بتقنية ((UPGMA)) توضح العلاقة بين السلالات الثلاث وداخلها . أظهرت نتيجة تحليل شجرة النسب أن العلاقة الوراثية بين سلالة الايراشاي و سلالة أبقار بطانة اقرب من العلاقة بين أبقار الايراشاي سلالة أبقار كنانة.

خلصت الدراسة إلى أن أبقار الايراشاي قد تكون تحت النوع لأبقار البطانة. هذا المستوى العالي من التباين الوراثي بين أفراد النوع الواحد يؤدي إلى تكهنات بأنها قد تنتمي إلى سلالات مختلفة على الرغم من وجود نفس الاسم والصفات الشكلية المتماثلة.

البحث يوصى إجراء المزيد من الدراسات باستخدام التقنيات الجزيئية الحديثة و الأكثر تحديدا ودقة لتوصيف الماشية السودانية ومن ثم إنشاء مركز لبحوث الثروة الحيوانية لتحقيق الهدف.

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LIST OF ABBREVIATIONS

AOAD.	.Arab Organization for Agriculture Development
.A.D	.Anno Domini
.AnGR	.Animal Genetic Resources
.ANOVA	.Analysis of variance
.AP	.Arbitrary Primed
.B.C	.Before Christ
.bp	.base pair
.CD	.Chest depth
.ARDKS	.Animal Resources Department Kassala State
.BL	.Body length
.CL	.Corpus length
.CP	.Crude protein
.DAD-IS	.Domestic Animal Diversity Information Service
.DAF	.DNA Amplification Fingerprinting
.DAGRIS	Domestic Animal Genetic Resources Information
	.System
.DBS	.Drop blood sample
.DNTPs	.Dry mater
.DNA	.Deoxyribonucleic acid
.EL	.Ear length

.FAO	.Food and Agriculture Organization
.FL	.Face length
.GDP	.Gross domestic product
.HG	.Heart girth
.HL	.Horn length
.HRP	.Height at rump
.HC	.Hump circumference
.HW	.Height at withers
.MAAP	.Multiple Arbitrary Amplicon Profiling
.MOARF	.Ministry of Animal Resources and Fisheries
.Ne	.Effective population size
.NL	.Neck length
.PBW	.Pin bone width
.PCR	.Polymerase chain reaction
.PW	.Pelvic width
.QTN	.Quantitative Trait Nucleotides
.RAPD	.Randomly Amplified Polymorphic DNA – RCR
.RCLB	.Red Cell Lysis Buffer
.RFLPs	.Restriction fragment length polymorphism
.SCAR	Sequence characterized amplified regions for amplification of specific band.
.SDS	.Sodium Di Sulphate
.SSR	.Simple Sequence Repeats
.TW	.Tail width at base
.TBE	.Tris Boric Acid EDTA
.TDN	.Total Digestible Nutrients
.TL	.Tail length
.TW	.Thigh width
.UV	.Ultra violet
.VNTR	.Variable number tandem repeat
.WCLB	.White Cell Lysis Buffer

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