

DEDICATION

TO MY FATHER'S SOUL

MY MOTHER,

MY HUSBAND,

MY BROTHERS,

MY SISTERS,

MY DAUGHTER

MAAB

AND

MY SON

MOHAMMED

Huda

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List of content

Subject Page

Dedication.....	I
Acknowledgment.....	II
List of content	III
List of tables.....	VIII
List of plates.....	IX
List of appendices.....	X
Abstract	XII
Arabic abstract.....	XV

CHAPTER ONE: INTRODUCTION

Introduction.....	1
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CHAPTER TWO: LITRATURE REVIEW

2.1: Sudanese cattle.....	3
2.1.1: Northern or Arab type of cattle.....	3
2.1.1.1: Kenana cattle.....	3
2.1.1.2: Butana cattle.....	3
2.1.1.3: White Nile cattle.....	3
2.1.1.4: Baggara cattle.....	3
2.2: Description of Baggara cattle.....	4
2.2.1: Nyallawi.....	5
2.2.2: Mesari.....	5
2.2.3: Rizigi.....	5
2.3: Growth and development.....	5
2.3.1: Factors affecting growth.....	6

2.3.1.1: Breed.....	6
2.3.1.2: Sex.....	7
2.3.1.3: Age.....	7
2.3.2: Growth measurements.....	8
2.3.2.1: Body measurements.....	8
2.3.2.2: Live weight.....	8
2.3.2: Growth curve.....	9
2.3.3: Growth and development of muscle, fat and bone.....	9
2.3.3.1: Growth and distribution of muscle, fat and bone.....	10
2.4: Body components.....	10
2.4.1: Non-carcass components.....	10
2.4.2: Dressing percentage.....	11
2.5: Muscle of the cattle carcass.....	11
2.5.1: Fore quarter muscle.....	11
2.5.1.1: <i>Supraspinatus</i>	11
2.5.1.2: <i>Infraspinatus</i>	12
2.5.1.3: <i>Triceps brachii</i>	12
2.5.1.4: <i>Biceps brachii</i>	13
2.5.1.5: <i>Longissimus (thoracis and lumbarum)</i>	13
2.5.1.6: <i>Lattissimusdorsi</i>	14
2.5.1.7: <i>Subscapular</i>	14
2.5.1.8: <i>Rhomboideus</i>	14
2.5.2: Hind quarter muscle.....	15
2.5.2.1: <i>Semimembranosus</i>	15
2.5.2.2: <i>Semitendnosus</i>	15

2.5.2.3: <i>Psoas major</i>	16
2.5.2.4: <i>Gluteus medius</i>	16
2.5.2.5: <i>Biceps femoris</i>	17
2.5.2.6: <i>Vastus lateralis</i>	17
2.5.2.7: <i>Vastus medialis</i>	18
2.5.2.8: <i>Vastus intermedius</i>	18
2.5.2.9: <i>Gastrocnemius</i>	18
2.6: Muscle structure and chemical composition.....	19
2.6.1: Muscle structure.....	19
2.6.2: Chemical composition.....	20
2.7: Quality attributes	21
2.7.1: Color.....	21
2.7.2: Tenderness and juiciness.....	22
2.7.3: Flavor and aroma.....	22
2.8: Physiochemical properties.....	23
2.8.1: Water holding capacity (WHC).....	23
2.8.2: Cooking loss.....	23
2.8.3: PH.....	24

CHAPTER THREE: MATERIALS AND METHODS

3.1: Experimental animal.....	26
3.2: Experimental feed	26
3.3: Body measurements.....	26
3.4: Slaughter procedure and slaughtering	27
3.5: Non –carcass components.....	27
3.6: Carcass components	28

3.6.1: Linear carcass measurements.....	28
3.6.2: Dissection procedure.....	29
3.7: Preparation of samples for chemical analysis and quality assessment...	35
3.8: Chemical composition.....	35
3.8.1: Chemical analysis.....	35
3.9: Qualities attributes.....	35
3.9.1: Color measurement.....	35
3.10: Physico-chemical properties	35
3.10.1: Water holding capacity.....	35
3.10.2: PH determination.....	36
3.10.3: Cooking loss determination.....	36
3.11: Muscle size.....	36
3.12: Muscle photography.....	37
3.13: Statistical analysis.....	37

CHAPTER FOUR: RESULT

4.1: Live animal measurements	38
4.2: Body components.....	38
4.2.1: Non-carcass components.....	38
4.2 .2: Dressing percentage.....	41
4.3: External carcass measurements.....	41
4.4: Growth and distribution of muscle and fat.....	41
4.4.1: Muscle weight.....	41
4.5: Meat chemical composition.....	50
4.6: Meat color.....	53
4.7: Physiochemical properties.....	53

4.8: Muscle size.....	57
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CHAPTER FIVE: DISCUSSION

5.1: Live animals measurements.....	58
5.2: Body components.....	58
5.2.1: Non carcass components.....	58
5.2.2: Dressing percentages.....	58
5.3: External carcass measurements.....	59
5.4: Distribution of muscle and fat.....	59
5.5: Meat chemical composition.....	60
5.6: Muscle Colour.....	61
5.7: Muscle Physiochemical properties.....	61
5.8: Muscle Size.....	61
Conclusion.....	62
References.....	63
Appendices.....	77

List of tables

	Table name	Page
Table (1)	Body measurement (cm) of Baggara bulls sub – types	39
Table (2)	Non-carcass components (kg) of Baggara bulls sub – types (% of Empty Body Weight)	40
Table (3)	Carcass weight and dressing percentage of Baggara cattle sub-types	42
Table (4)	External carcass measurements of Baggara cattle sub-types measurements	43
Table (5)	Weight (kg) before trimming of individually selected muscles of Baggara cattle sub-types	44
Table (6)	Length (cm) of individually selected muscles of Baggara cattle sub-types	46
Table (7)	Width (cm) of individually selected muscles of Baggara cattle sub-types	47
Table (8)	Weight (kg) after trimming of individually selected muscles of Baggara cattle sub-types	48
Table (9)	Fat content (gm) of individually selected muscles of Baggara cattle sub-types	49
Table (10)	Chemical composition of individually selected fore quarter muscles of Baggara cattle sub-types	51
Table (11)	Chemical composition of individually selected hind quarter muscles of Baggara cattle sub-types	52
Table (12)	Colour values of individually selected muscles of Baggara cattle sub-types	55
Table (13)	Physicochemical properties of individually selected muscles of Baggara cattle sub-types	56
Table (14)	Size (cm ³) of individually selected muscles of Baggara cattle sub-types	58

List of plates

Plate (1): Carcass sectional view.....	31
Plate (2): Beef cross sectional view.....	32
Plate (3): Fore quarter primal.....	33
Plate (4): Hind quarter primal.....	34

List of appendices

Appendix (1): Mesari and Nyalawi bulls.....	77
Appendix (2): Fore quarter muscle.....	78
Appendix (3): Hind quarter muscle.....	82
Appendix (4): Figures:	
Figure (1): Effect of cattle subtype on external body measurement (cm) of Baggara bulls.....	87
Figure (2): Effect of cattle subtype on percentage of non-carcass components of Baggara bulls (% of Empty Body Weight)	87
Figure (3): Effect of Baggara cattle subtype on dressing percentage.....	88
Figure (4): Effect of Baggara cattle subtype on external carcass Measurements.....	88
Figure (5): Effect of Baggara cattle subtype on weight (kg) of individual fore quarter muscle before dissection.....	89
Figure (6): Effect of Baggara cattle subtype on weight (kg) of individual hind quarter muscle before trimming.....	89
Figure (7): Effect of cattle subtype on length of fore quarter individual muscle (cm).....	90
Figure (8): Effect of Baggara cattle subtype on length of hind quarter individual muscles (cm).....	90
Figure (9): Effect of cattle subtype on individual fore quarter muscles width (cm).....	91
Figure (10): Effect of cattle subtype on individual hind quarter muscles width (cm).....	91
Figure (11): Effect of cattle subtype on individual fore quarter muscles weight (kg) after trimming.....	92

Figure (12): Effect of Baggara cattle subtype on individual hind quarter muscles weight (kg) after trimming.....	92
Figure (13): Effect of cattle subtype on fat content of individual fore quarter muscles.....	93
Figure (14): Effect of cattle subtype on fat content of individual hind quarter muscle.....	93
Figure (15): Effect of cattle subtypes on physicochemical properties of fore Quarter individual muscle.....	94
Figure (16): Effect of Baggara cattle subtypes on physicochemical properties of hind quarter individual muscles.....	95
Figure (17): Effect of cattle subtype on colour values of individual fore quarter muscles.....	96
Figure (18): Effect of cattle subtype on colour values of individual hind quarter muscles.....	97
Figure (19): Effect of cattle subtype on chemical composition of in Individual fore quarter muscles.....	98
Figure (20): Effect of cattle subtype on chemical composition of in individual hind quarter muscles.....	99
Figure (21): Effect of Baggara cattle subtype on volume of individual fore quarter muscles.....	100
Figure (22): Effect of Baggara cattle subtype on volume of individual hind quarter muscle.....	100

Abstract

Twenty four fattened Baggara bulls (Nyalawi and Messari) (twelve each) were selected from the commercial herd at the Animal Production Research Center (kuku), Khartoum North. The animals were used to study characteristics of eighteen selected muscles. The bulls were fed ad libitum on a concentrate molasses diet and sorghum straw at the rate of 80% and 20% respectively.

Live body measurements, slaughter data, carcass data, muscles size, meat chemical composition, muscle quality attributes were studied.

Live body measurements of the two sub-types of Baggara bulls (Nyallawi and Messari) show there were no significant different ($P>0.05$) in all studied parameters with the exception of heart girth around hump where Nyallawi bulls recorded (172.67 cm) while Messari bull recorded(169.00 cm). Regarding side length; Nyallawi recorded 105.83 cm and Messari 101.55 cm; chest depth was 55.71 cm for Nyalawi and 54.74 cm for Messari, the pelvic width was 28.95 for Messari and 26.63 cm for Nyalawi.

The percentages of all non-carcass components related to empty body weight were not significantly different ($P>0.05$) between the two cattle sub-types and hence there was no significant difference between the two cattle sub-types in dressing percentages for both hot and cold carcass weight (on slaughter weight and empty body weight basis).

All external carcass measurements of the two sub-types had no significant differences ($P>0.05$) except rib eye muscle area was significantly ($P<0.01$) wider in Nyallawi than Messari bull.

The weights of the selected muscles before trimming were not significantly differed between the two sub-types of bulls except in the *M. Biceps brachii* in which Nyallawi had the heavier weight 0.309 kg while *M. Infraspinatus* showed significant difference ($P<0.01$) where as *M. Latissimus dorsi* was heavier in Mesari sub-type.

The cattle sub-type had no significant effect on length of selected muscles except for *M. Gluteus medius* in which Nyallawi had the significantly ($P<0.05$) longer muscle 32.67 cm versus 24.55 cm for Messari, the length of *M. Semimembranosus* was 31.41 cm for Messari and 29.75 cm for Nyallawi, Whereas the Muscles width was affected by cattle sub-type for two muscles; *M. Semimembranosus* in which Messari sub-type had significantly ($P<0.01$) wider muscle and *M. Gastrocnemius* was significantly ($P<0.05$) wider in Nyallawi. The Weight of individual muscle after trimming was affected by the cattle sub-type in two muscles, *M. biceps brachii* and *M. Infraspinatus* were significantly heavier ($P<0.05$) in Nyallawi than Mesari. Fat content of the individual muscles were not affected by cattle sub-type except for *M. Rhomboideus* and *M. gluteus medius* where Nyallawi had significant ($P<0.05$) higher fat content.

Mesari cattle sub-type had significantly ($P<0.05$) higher moisture content in *M. Infraspinatus*, *M. Supraspinatus* and *M. Semimembranosus*. For protein content Nyallawi sub-type had significantly ($P<0.01$) higher content for *M. Infraspinatus*, *M. Supraspinatus* and *M. Semimembranosus*. Ether extract differed between the selected muscle of the two cattle sub-types bulls for *M. biceps femoris* and *M. Longissimus lumborum* in which Messari had the higher ether extract. Ash content of the individual muscles was not affected by cattle sub-type.

The numerical color value lightness (L) differed in two muscles; *M. Infraspinatus* and *M. biceps femoris*; the former muscles had the higher light color value (L) in Messari sub-type (32.14), Nyallawi had the higher light color value (L) in *M. Biceps femoris* redness (a) color value of *M. triceps brachii*, *M. Supra spinatus* and *M. Longissimus lumborum* differed between Messari and Nyallawi; Nyallawi had the higher value. Color value yellowness (b) was found to be affected by cattle sub-type for the *M. Longissimus lumborum* in which Nyallawi had the higher value 5.86.

Physiochemical properties of individual muscles (water holding capacity, cooking loss and muscle PH) were determined for the two sub-types and it was found that ,water holding capacity of *M. Semitendinosus* and *M. Triceps brachii* were higher in Messari sub-type, whereas cooking loss of *M. Longissimus thoracic* differed between Nyallawi and Messari (Messari had the higher cooking loss).

The size of individual muscles of the two sub-type was significant different ($P<0.01$) for *M. Gastrocnemius* and *M. V. medialis* ($P<0.05$) in which Nyallawi had the higher size.

مستخلص البحث

أجريت هذه التجربة على عدد ٢٤ رأس من عجول أبقار البقارة (نيالاوي ومسيري) والتي تم إختيارها من قطيع تجاري بمركز أبحاث الإنتاج الحيواني بكوكو (شرق النيل)، لتحديد خصائص عضلة من عضلات الجسم وقد تم تغذيتها بصورة متاحة على عليفة مركزة مكونة من ٨٠% عليفة مولاس و ٢٠% قصب ذرة رفيعة (١٢ رأس لكل نوع).

أظهرت القياسات الحية على النوعين عدم وجود فروق معنوية ($P>0.05$) في كل الخصائص قيد الدراسة بإستثناء محيط الصدر حول السنام, طول الجانب, عمق الصدر وعرض الحوض والتي تساوي ١٧٢,٦٧ سم و١٦٩ سم, ١٠٥,٨٣ سم و ١٠١,٥٥ سم, ٥٥,٧١ سم و ٥٤,٧٤ سم و ٢٦,٦٣ سم, ٢٨,٩٥ سم عند النيالاوي والمسيري على التوالي.

لم توجد فروق معنوية بين النسب المئوية للاحشاء بين النوعين من الأبقار ($P>0.05$). وكذلك أظهرت الدراسة عدم تأثير نسبة التصافي للذبيح عند الذبح وبعد التبريد بنوع الأبقار (على أساس الوزن عند الذبح و الوزن الفارغ).

أظهرت الدراسة أيضاً عدم وجود فروق معنوية ($P>0.05$) في قياسات الذبيحة الخارجية لكلا النوعين من الأبقار بإستثناء مساحة العضلة العينية والتي يتفوق فيها النوع النيالاوي ٥٣,٧٠ سم^٢ مقابل ٤٥,٩٣ سم^٢ للنوع المسيري.

كان وزن العضلات المختارة قبل التشذيب متماثلاً بين النوعين من الأبقار عدا عضلة *M. Biceps brachii* كان وزنها في النوع النيالاوي أثقل من المسيري وكذلك *M. Infraspinatus* وبالعكس فإن *Latissimus dorsi* يمتاز فيها النوع المسيري بوزن أثقل من النيالاوي.

وقد لوحظ عدم تأثير طول العضلات المختارة بنوع الحيوان عدا عضلة *M. Gluteus medius* والتي كان طولها في النيالاوي بطول ٣٢,٦٧ سم مقابل ٢٤,٥٥ سم للنوع المسيري وكذلك *M. Semimembranosus* والتي يمتاز النوع المسيري بطول أكبر ٣١,٤١ سم مقابل ٢٩,٧٥ سم للنوع النيالاوي. أما عرض عضلة كل من *M. Semimembranosus* و *M. Gastrocnemius* فقد كان أكبر في النوع المسيري في العضلة الأولى والنوع النيالاوي في العضلة الثانية. كذلك وزن كل من عضلتي *M. Bicepsbrachii* و *M. Infraspinatus* كان أثقل في النوع

النيالاوي مقارنة بالمسيري. وقد لوحظ عدم تأثر محتوى الدهن للعضلات بنوع الحيوان عدا عضلتي *M. Gluteusmedius* و *Rhomboideus* كان أكبر في النيالاوي. أما نسبة الرطوبة للعضلات *M. Infraspinatus, M. Supraspinatus* and *M. Semimembranosus* فقد تأثرت بنوع الأبقار حيث إرتفعت النوع المسيري مقارنة بالنوع النيالاوي. وقد وجد أن محتوى البروتين في العضلات الثلاثة السالفة الذكر أعلى عند النوع النيالاوي. وقد وجد إختلاف في محتوى الدهن للعضلات المختارة لهذين النوعين من الأبقار خاصةً لعضلتي *M. Longissimus* و *Biceps femoris* والتي يمتاز فيهما النوع المسيري بنسبة دهن عالية. لم يتأثر محتوى الرماد للعضلات المختارة بنوع الأبقار.

إختلفت موجات اللون الفاتح (L) في عضلتي *Infraspinatus* و *Biceps femoris* حيث وجد أن عضلة *Infraspinatus* تحوي قيمة لونية أكبر للنوع المسيري (٣٢,١٤) وعضلة *Biceps femoris* تحوي قيمة أكبر للنوع النيالاوي. موجات اللون الأحمر (a) فقد إختلفت في عضلات *Triceps brachii, Supraspinatus* and *Longissimus lumborum* بين النوعين من الأبقار وكانت أعلى في النوع النيالاوي. موجات اللون الأصفر (b) إختلفت في النوعين من الأبقار في عضلة *Longissimus lumborum* حيث نجد أن الصفة اللونية أكبر في النوع النيالاوي (٥,٨٦).

أما دراسة الخصائص الفيزيوكيميائية للعضلات (قابلية حمل الماء، الفاقد بعد الطبخ ودرجة الأس الهيدروجيني) في كلا النوعين فقد أفادت أن قابلية حمل الماء لعضلتي *M. Triceps brachii* و *M. Semitendinosus* أكبر في النوع المسيري. وأن الفاقد بعد الطبخ في العضلة *M. Longissimus thoracic* يختلف بين النوعين حيث يكون الفاقد أكبر في حالة النوع المسيري.

وقد أوضحت الدراسة وجود فروق معنوية بين أحجام العضلات *Gastrocnemius* و *M.V. medialis* ($P<0.01$) والتي يمتاز فيهما النوع النيالاوي بأكبر حجم هاتين العضلتين.