

DEDICATION

TO MY PARENTS

MY WIFE

MY BROTHERS

AND SISTERS

MOHAMMED

Acknowledgements

Praise is in the first place be to Almighty Allah, who gave me health and aptitude to complete this work.

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List of Contents

| No | Title | Page |
|----|------------------|------|
| | Dedication | I |
| | Acknowledgements | II |
| | List of Contents | III |
| | List of Tables | VIII |

| | |
|------------------------------------------------------------|-----|
| List of Figures | IX |
| List of Appendices | X |
| Abstract | XI |
| Abstract in Arabic | XII |
| Introduction | 1 |
| Chapter one: | |
| Literature Review | |
| | 3 |
| 1.1. Digestion in ruminants | 3 |
| 1.2. Protein | 4 |
| 1.2.1. By Pass protein | 5 |
| 1.2.2. Protein fraction | 5 |
| 1.2.3. Effects of stage of maturity on protein | |
| Degradation | 5 |
| 1.2.4. Soya bean Meal | 6 |
| 1.2.5. Cotton seeds | 6 |
| 1.2.6. Sunflower seeds | 6 |
| 1.2.7. Sesame seeds meal | 7 |
| 1.2.8. Groundnut cake | 7 |
| 1.3. <i>Balanites aegyptiaca</i> trees | 8 |
| 1.3.1. Chemical Composition of <i>Balanites aegyptiaca</i> | 10 |
| 1.4. Gas Production | 12 |
| 1.5. Protein and Dry matter degradation | 13 |
| 1.5.1. Non protein nitrogen | 14 |
| 1.5.2. Rumen undegraded protein | 14 |
| 1.6. Rumen Environment | 15 |

| | | |
|----------|-------------------------------------|----|
| 1.6.1. | Ruminal PH. | 16 |
| 1.6.2. | Rumen ammonia. | 17 |
| 1.6.3. | Volatile fatty acid. | 18 |
| 1.6.4. | The rumen bacteria. | 19 |
| 1.7. | The blood | 20 |
| 1.7.1. | Function of blood | 20 |
| 1.7.2. | Haematogram in rumen | 21 |
| 1.7.2.1. | General physiology of blood | 21 |
| 1.7.2.2. | Haemoglobin | 22 |
| 1.7.2.3. | Red blood cells | 22 |
| 1.7.2.4. | white blood cells | 23 |
| 1.7.2.5. | Packed cells value | 23 |
| 1.7.2.6 | Erythrocyte Sedimentation Rate | 23 |
| 1.7.3. | Blood metabolites | 24 |
| 1.7.3.1. | Protein Effects on Blood Parameters | 24 |
| 1.7.3.2. | Serum glucose | 24 |
| 1.7.3.3. | Serum cholesterol | 25 |
| 1.7.3.4. | Serum albumin | 25 |
| 1.7.3.5. | Blood urea | 26 |
| 1.7.3.6. | Blood total protein | 27 |

Chapter Two:

Material and Methods

| | | |
|--------|-----------------------------|----|
| 2.1. | <i>Balanites aegyptiaca</i> | 28 |
| 2.1.1. | Sample collection | 28 |

| | | |
|----------|-----------------------------------------|----|
| 2.1.2. | Chemical analysis | 28 |
| 2.2. | Animal and feeding | 28 |
| 2.3. | Invitro gas production | 29 |
| 2.4. | In situ Ruminant Nutrient Degradability | 30 |
| 2.5. | Statistical analysis | 31 |
| 2.6. | Rumen Environment study | 31 |
| 2.6.1. | Feeds | 31 |
| 2.6.2. | Experimental animals | 31 |
| 2.6.3. | Ration ingredient | 32 |
| 2.6.4. | Rumen Environment | 33 |
| 2.6.5.1. | Rumen pH | 33 |
| 2.6.5.2. | Rumen ammonia | 33 |
| 2.6.5.3. | Rumen Volatile fatty acids (VFA) | 34 |
| 2.6.5.4. | Rumen bacteria | 34 |
| 2.7. | Blood sample | 35 |
| 2.7.1. | Blood Haemogram | 35 |
| 2.7.1.1. | Haemoglobin | 35 |
| 2.7.1.2. | Packed cells value | 35 |
| 2.7.1.3. | Red blood cells | 35 |
| 2.7.1.4. | White blood cells | 35 |
| 2.7.2. | Blood metabolites | 36 |
| 2.7.2.1. | Blood glucose | 36 |
| 2.7.2.2. | Total protein | 36 |
| 2.7.2.3. | Blood cholesterol | 37 |
| 2.7.2.4. | Blood albumin | 37 |

| | | |
|----------|------------|----|
| 2.7.2.5. | Blood urea | 38 |
|----------|------------|----|

Chapter three:

The Results

| | | |
|--------|---------------------------------------------------------------------------|----|
| 3.1. | Chemical composition of different parts of <i>Balanites aegyptiaca</i> | 39 |
| 3.2. | Gas production | 41 |
| 3.3. | Degradability study | 44 |
| 3.3.1. | Dry matter degradable (DM) | 44 |
| 3.3.2. | Protein degradability | 47 |
| 3.4: | Rumen environment study | 50 |
| 3.4.1. | Ruminal pH | 50 |
| 3.4.2. | Ruminal ammonia (NH ₃) | 52 |
| 3.4.3. | Volatile fatty acids (VFA) production | 54 |
| 3.4.4. | Bacterial count | 56 |
| 3.5. | The blood | 58 |
| 3.5.1. | Haematogram in ruminant | 58 |
| 3.5.2. | Blood metabolites | 60 |

Chapter four: Discussion

| | |
|---------------------|----|
| DISCUSSION | 62 |
| CONCLUSION | 72 |
| RECOMMENDATION | 73 |
| REFERENCE | 74 |
| REFERENCE IN ARABIC | 97 |

LIST OF TABLES

| Table | | Page |
|--------------|---------------------------------------------------------------------------------|-------------|
| 1. | The chemical composition of the different parts of <i>B. agyptiaca</i> | 40 |
| 2. | The parameters estimated from the gas production of <i>B agyptiaca</i> parts | 43 |
| 3. | <i>In situ</i> Dry Matter Disappearance Rate (%) in the | |

| | | |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------|----|
| | Different parts of <i>Balanite aegyptiaca</i> tree. | 45 |
| 4. | <i>In situ</i> DM degradability (%) characteristics in the different parts of <i>Balanites aegyptiaca</i> trees. | 46 |
| 5. | <i>In situ</i> protein disappearance rate(%) in the different parts of <i>Balanites aegyptiaca</i> tree . | 48 |
| 6. | <i>In situ</i> Protein degradation (%) characteristics | 49 |
| 7. | Ruminal pH values of the animals fed of the Experimental diets. | 51 |
| 8. | Rumen ammonia (NH ₃)(mg/100ml) concentration of The experimental animals fed of the experimental diets | 53 |
| 9. | Ruminal Volatile fatty acids concentration (VFA)(mg/100ml) of the experimental animals fed On the experimental diets. | 55 |
| 10. | Rumen Bacterial counts (colony/ml) the experimental Animals fed on the experimental diets. | 57 |
| 11- | Haematogram Parameters in the different incubation time (0 – 9hrs)of the cattle fed different level of <i>B. aegyptiaca</i> cake. | 59 |
| 12- | Serum constituents in the different incubation time (0 – 9hrs) of cattle fed different level of <i>Balanite aegyptiaca</i> Kernel cake. | 61 |

LIST OF FIGURES

| Figure | page | |
|---------------|-----------------------------------------------------|----|
| 1. | Data of gas production during the incubation period | 41 |

LIST OF APPENDICES

Appendix 1: *Balanites aegyptiaca*
tree.....98

Appendix 2: The *Balanites aegyptiaca*
leaves 99

| | |
|------------------------------------------------------------------------|-----|
| Appendix 3: The <i>Balanites aegyptiaca</i> coat | 100 |
| Appendix 4: The <i>Balanites aegyptiaca</i> flesh | 101 |
| Appendix 5: A ripe fruits of <i>Balanites aegyptiaca</i> | 102 |
| Appendix 6: The pods of seeds of <i>Balanites aegyptiaca</i> | 103 |
| Appendix 7: The kernel of <i>Balanites aegyptiaca</i> | 104 |
| Appendix 8: The <i>Balanites aegyptiaca</i> kernel cake | 105 |
| Appendix 9: The fistulated steer No (1) | 106 |
| Appendix 10: The fistulated steer No (2) | 107 |
| Appendix 11: The fistulated steer No (3) | 108 |
| Appendix 12: The fistulated steers | 109 |

Abstract

This study was carried out at the Experimental Farm Unit of the College of Veterinary Medicine and Animal Production, Sudan University of Science and Technology at Hillat Kuku. Three steers were used to study and compare the digestion characteristics of the different parts of *Balanites aegyptiaca* (leaves, coat, flesh and kernel cake) and the effect of different levels of *B. aegyptiaca* kernel cake on the rumen environment and some haematological and biochemical constituents . Samples of *Balanites aegyptiaca* leaves, coat, flesh and kernel cake were collected from North Kordofan state during April 2008.

The kernel cake showed the highest crude protein and Ash content and the lowest contents were found in the coat. The highest value of nitrogen free extract and crude fibre were recorded in the coat. The kernel cake had the highest dry matter and crude protein degradation rate while the coat exhibited the lowest degradability characteristics.

In this study gas production after 48hrs incubation time ranged between 10.00 (leaves) and 66.00ml/200gDM (flesh). *Balanites aegyptiaca* flesh had a significantly higher ($P<0.05$) gas production from rapid soluble fraction (a) (22.61), than the leaves, (3.5), and coat, (9.73), while *Balanites aegyptiaca*

kernel cake showed the highest gas production from slowly degradable fraction (b) and gas production rate (c).

Organic matter digestibility range was (59.22 – 80.82%) and Metabolisable energy was found to be (8.99 – 17.40MJ/kgDM) in the coat and kernel cake, respectively.

Replacing groundnut cake with *B. aegyptiaca* kernel cake up to 15% did not affect the rumen environment or the blood profile in the cattle rations.

ملخص الدراسة

أجريت هذه الدراسة في جامعة السودان للعلوم والتكنولوجيا كلية الطب البيطري والإنتاج الحيواني حلة كوكو. استخدمت فيها ثلاثة عجول مخصيه لدراسة ومقارنة النواحي الفسيولوجية لهضم الأجزاء المختلفة من شجرة اللالوب (الورق, القشرة, لب الثمرة وكسب بذرة النواة) كما تم تقييم الأثر الفسيولوجي علي بيئة الكرش ومكونات الدم في المجترات حيث تم جمع العينات من ولاية شمال كردفان في ابريل 2008. وجد إن كسب بذرة النواة يحوي نسبة عالية من البروتين الخام والرماد مقارنة بالقشرة التي تحوي نسبة منخفضة منهما , والقشرة هي الاخرى تحوي نسبة مرتفعة من المستخلص الخالي من النيتروجين والألياف الخام . نسبة التكسر للمادة الجافة والبروتين في الكرش مرتفعة لكل الأجزاء عدا القشرة . وإنتاج الغاز معمليا بعد مرور 48 ساعة من التحضين يتراوح ما بين 10مل/200جم مادة جافة في الورق و 66مل/200جم مادة جافة في لب الثمرة والتي ترتفع عندها نسبة الغاز المنتج في الأجزاء سريعة التحلل

عنه في الورق والقشرة بينما هذه النسبة عالية أيضا في الأجزاء بطيئة التحلل في كسب بذرة النواة .

نسبة المادة العضوية المهضومة وجدت إنها تتراوح ما بين 59,22 – 80,82% والطاقة الأيضية ما بين 8,99 – 17,41 ميغاجول/كجم مادة جافة في القشرة وكسب بذرة النواة .

في هذه الدراسة وجد انه عند إضافة مستويات مختلفة من كسب بذرة النواة كمصدر للبروتين لم يظهر تأثير معنوي أو فسيولوجي علي بيئة الكرش ومكونات الدم المختلفة .

بينت الدراسة انه يمكن إضافة كسب بذرة النواة لشجرة الهجليج بنسبة تتجاوز 15% كمصدر للبروتين في علائق الأبقار.