

**POSSIBILITY OF TREATING AGRICULTURAL BY-  
PRODUCTS BY EXOGENOUS ENZYMES  
AND ANAEROBIC BACTERIA TO  
PRODUCE RUMINANT  
FEEDS**

By  
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A thesis submitted in partial fulfillment  
of  
the requirements for the degree of

**MASTER OF SCIENCE**

in  
**Agricultural Science  
(Animal Nutrition)**

**Department of Animal Production  
Faculty of Agriculture  
Ain Shams University**

**2012**

## **Approval sheet**

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# إمكانية معاملة المخلفات الزراعية بإنزيمات خارجية وبكتريا لاهوائية لإنتاج أعلاف للمجترات

رسالة مقدمة من

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للحصول على

**درجة الماجستير في العلوم الزراعية**

**(تغذية حيوان)**

قسم الإنتاج الحيواني

كلية الزراعة

جامعة عين شمس

2012

صفحة الموافقة على الرسالة

إمكانية معاملة المخلفات الزراعية بإنزيمات خارجية وبكتريا لاهوائية  
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للحصول على

درجة الماجستير في العلوم الزراعية

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رسالة ماجستير

اسم الطالب : رأفت محمود محمد جمعة  
عنوان الرسالة : إمكانية معاملة المخلفات الزراعية بإنزيمات خارجية وبكتريا  
لاهوائية لإنتاج اعلاف للمجترات  
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تاريخ التسجيل : ٢٠٠٧ / 9 / 19

الدراسات العليا

أجيزت الرسالة بتاريخ / ٢٠١٢

ختم الإجازة

موافقة مجلس الجامعة  
٢٠١٢ / /

موافقة مجلس الكلية  
٢٠١٢ / /

## ACKNOWLEDGEMENT

I thank Allah, the most gracious, most beneficent and merciful for the help and guidance to achieve goals and make them possible.

I wish to express my sincere appreciation and deepest gratitude to my advisor **Professor Dr. Hany M. Gado**, professor of Animal Nutrition, Animal Production Department, Faculty of Agriculture, Ain Shams University for suggesting the problem, continuous supervision support, valuable helps, guidance and patient throughout the course of this work.

I'm sincerely thankful to **Professor Dr. Hamdy M. El sayed**, professor of Animal Nutrition, Animal Production Department, Faculty of Agriculture, Ain Shams University, for that every possible help and guidance kindly offered during the investigation.

Deep thanks are due to **Professor Dr. Soliman M. Abd El mawla**, professor of Animal Nutrition, Animal Production Department, Faculty of Agriculture, Ain Shams University for his continuous help during the experimental work of the research.

Many thanks are also due to my family father, mother and sister. I can't forget my wife and my daughters Maryam and Eman.

Grateful acknowledgment should be also extend to the staff members of the Department of Animal Production, Faculty of Agriculture, Ain Shams University for all facilities they offered to make this work possible.

## ABSTRACT

**Raafat Mahmoud Mohamed Gomaa. Possibility of treating agricultural by-product by exogenous enzymes and anaerobic bacteria to produce ruminant feeds. Unpublished M.Sc. Thesis, Department of Animal Production, Faculty of Agriculture, Ain Shams University, 2012.**

The objectives of this study were to verify the potential benefits of growing green barley on anaerobic enzyme (ZAD) treated rice straw. In addition, the work intended to investigate the effect of this treatment on digestibility parameters in Ossimi sheep. A complete random design was used to distribute twelve mature male of Ossimi sheep (45.0 ± 0.5 Kg wt.) on the following treatments: Rice straw with grown barley (RSGB) without either ZAD or orange pulp (T1 and it will be control), RSGB plus ZAD (T2), RSGB plus orange pulp (T3) and RSGB + ZAD + orange pulp (T4). The obtained results could be summarized as follow

- 1- Significant decreases were observed in %CF from 38.09 for T1 to 32.01 and 30.02 for rations T4 and T2, respectively ( $P < 0.05$ ). Percentage values of NDF were 70.01, 72.10 and 76.01 for rations T4, T2 and T1, respectively ( $P < 0.05$ ); while %ADF values were 50.05, 52.10 and 58.10 for rations T4, T2 and T1, respectively ( $P < 0.05$ ) and %ADL was 6.01 for T4 versus 8.01 for T1. And significant increases in %CP content to 7.96, 7.10, 7.95 for ration T4, T3, T2, respectively compared to the control ration was 5.75 ( $P < 0.05$ ).
- 2- Adding ZAD to RSGB significantly increased ( $p < 0.05$ ) %TDN to 55.02 and 59.02 for treatments T2 and T4, respectively and increased digestibility coefficients of CP to 72.43 and 77.70, respectively.
- 3- Rams fed rations T2, T3 and T4 had significantly higher values of ruminal ammonia-N 3 hrs. post feeding values were 25.41, 25.03, 25.96 mg/100ml, respectively and total volatile fatty acids 3 hrs. post feeding were 8.20, 8.13 and 8.26 m.eq/100ml, respectively.
- 4- Adding either ZAD, orange pulp or both to RSGB significantly increased ( $p < 0.05$ ) plasma total protein values were 6.43, 6.23, 5.82 g/dl for treatments T4, T3, T2, respectively, while treating rations with ZAD reflected low level of

ALT 6 hrs. post feeding values were 20.64 and 20.61 for treatments T2 and T4, respectively versus T1 (20.90  $\mu$ l).

It could be concluded that anaerobic enzyme matrix (ZAD) improved the nutritive value of soilless green barley and improved their digestibility coefficients in Ossimi sheep

**ZAD** is a compound of enzymes are separated from anaerobic bacteria separated from the rumen, it contain a mix of cellulase, hemicellulase, protease and alpha amylase enzymes.

**Keywords:** Ossimi sheep, Barely, Exogenous enzymes, Rice straw, Ruminant feed, digestibility, nutritive value, rumen liquor parameters, blood serum parameters.

# Contents

## Page

|                                                                                                                      |          |
|----------------------------------------------------------------------------------------------------------------------|----------|
| <b>1. INTRODUCTION.....</b>                                                                                          | <b>1</b> |
| <b>2. REVIEW of LITERATURE.....</b>                                                                                  | <b>3</b> |
| 2.1.1. Lignocellulosic agricultural by-products and its<br>manufacturing in Egypt.....                               | 3        |
| 2.1.2. The effect of biological treatments for agricultural<br>by-products.....                                      | 3        |
| 2.1.3. How cellulase effect on agricultural by-products.....                                                         | 4        |
| 2.1.4. Treating with ZAD® as a liquid enzyme product.....                                                            | 4        |
| 2.1.4.1. ZAD® with rice straw.....                                                                                   | 4        |
| 2.1.4.2. ZAD® with sugar cane bagasse.....                                                                           | 5        |
| 2.1.4.3. ZAD® with corn stalks.....                                                                                  | 6        |
| 2.1.4.4. ZAD® with bean straw.....                                                                                   | 6        |
| 2.1.4.5. ZAD® with Orange pulp.....                                                                                  | 6        |
| 2.2. Biological treatments for agriculture by-products.....                                                          | 6        |
| 2.2.1. Biological treatments for silage and roughages on goats...                                                    | 6        |
| 2.2.2. Effect of biological treatments on sugarcane bagasse<br>digestibility and performance of Baladi goats.....    | 7        |
| 2.2.3. Effect of chemical and biological treatments of some crop-<br>residues on their nutritive value on goats..... | 8        |
| 2.2.4. Biological treatment on rice straw on sheep.....                                                              | 8        |
| 2.2.5. Treatment of agricultural by-products to manufacture silage.                                                  | 9        |
| 2.2.6. Effect of biological treatments by cellulolytic bacteria on                                                   | 10       |

chemical composition and cell wall constituents of some roughage.

|                                                                                                                                                          |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 2.2.7 Effect of different cellulolytic rumen bacteria on fiber digestion.....                                                                            | 11 |
| 2.3. Fibrolytic enzyme.....                                                                                                                              | 11 |
| 2.3.1. Fibrolytic enzymes and ruminants.....                                                                                                             | 11 |
| 2.3.2. Treating with fungi enzymes.....                                                                                                                  | 12 |
| 2.3.3. Fibrolytic enzymes and the digestibility.....                                                                                                     | 14 |
| 2.3.3.1. The effect on In-vitro and In-situ digestibility.....                                                                                           | 14 |
| 2.3.3.2. In-vivo digestibility.....                                                                                                                      | 16 |
| 2.3.3.2.1. Effect on nutrients digestibility.....                                                                                                        | 16 |
| 2.4. Effect of treated agricultural by products on rumen and blood serum parameters.....                                                                 | 20 |
| 2.4.1. Effect on rumen parameters.....                                                                                                                   | 20 |
| 2.4.2. Effect on some blood serum parameters.....                                                                                                        | 21 |
| 2.4.3. Effect on sheep.....                                                                                                                              | 22 |
| 2.4.4. Effect on goats.....                                                                                                                              | 22 |
| 2.4.5. Evaluation differences of some ruminal bacteria by In vitro dry matter, cellulose and hemicellulose disappearance rate and extent of bagasse..... | 23 |
| 2.4.6. Use of biotechnology to improve the utilization of rumen contents in ruminant rations.....                                                        | 23 |
| 2.4.7. Effect of some biological treatments on the nutritive value of agricultural by-products.....                                                      | 25 |
| 2.4.8. Effect of anaerobic enzyme matrix on fiber digestibility...                                                                                       | 26 |
| 2.4.9. Enzymatic treatments of sugarcane bagasse by different                                                                                            | 27 |

|                                                                    |           |
|--------------------------------------------------------------------|-----------|
| sources of cellulase enzymes.....                                  |           |
| 2.5. Feeding values of the experimental rations.....               | 27        |
| 2.6. Fibrolytic enzymes treatment of barley grains.....            | 28        |
| 2.7. Green fodder production under hydroponic conditions.....      | 29        |
| <b>3. MATERIALS AND METHODS.....</b>                               | <b>30</b> |
| 3.1. Preparing of rice straw.....                                  | 30        |
| 3.2. Seed and grain selection.....                                 | 30        |
| 3.3. The quantity of straw and barely grains.....                  | 31        |
| 3.4. Mixing between rice straw and orange pulp.....                | 31        |
| 3.5. The optimum quantity of water.....                            | 31        |
| 3.6. The optimum quantity of enzyme.....                           | 31        |
| 3.7. Ensiling experiment.....                                      | 32        |
| 3.8. Proximate analysis.....                                       | 33        |
| 3.9. Fiber fraction.....                                           | 33        |
| 3.10. Experiment I: In vitro DM disappearances (IVDMD).....        | 34        |
| 3.11. Experiment II: Metabolism trial (in vivo).....               | 35        |
| 3.12.1. Rumen liquor parameters.....                               | 36        |
| 3.12.1.1. Rumen liquor samples.....                                | 36        |
| 3.12.1.2. Determination of rumen pH.....                           | 36        |
| 3.12.1.3. Ammonia nitrogen concentration (NH <sub>3</sub> -N)..... | 36        |
| 3.12.1.4. Total volatile fatty acids (TVFA's).....                 | 36        |
| 3.12.2. Blood parameters and measurements.....                     | 37        |
| 3.12.2.1. Blood plasma sampling.....                               | 37        |
| 3.12.2.2. Plasma urea.....                                         | 37        |
| 3.12.2.3. Plasma total proteins.....                               | 37        |
| 3.12.2.4. Plasma total lipids.....                                 | 37        |

|                                                                                                         |           |
|---------------------------------------------------------------------------------------------------------|-----------|
| 3.12.2.5. Plasma creatinine.....                                                                        | 37        |
| 3.12.2.6. Plasma ALT.....                                                                               | 38        |
| 3.12.2.7. Plasma AST.....                                                                               | 38        |
| 3.13. Management of animals in experiment II.....                                                       | 38        |
| 3.14. Statistical analysis.....                                                                         | 38        |
| <b>4. RESULTS AND DISCUSSIONS.....</b>                                                                  | <b>40</b> |
| 4.1. Effect of boiling water and soaked water and ZAD on the<br>Chemical composition of rice straw..... | 40        |
| 4.2. Effect of growing some seeds and grains using ZAD.....                                             | 41        |
| 4.2.1. Using of cow peas, sudan grass, peart millet and sweet<br>sorghum (50% cover percentage).....    | 41        |
| 4.2.2. Using of fenugreek 50% cover percentage.....                                                     | 42        |
| 4.2.3. Effect of ZAD on the chemical composition of barley<br>(50% cover percentage).....               | 44        |
| 4.2.4. Using of Canary grass seeds 50% cover percentage.....                                            | 46        |
| 4.2.5. Using of 1/3 of fenugreek seeds with 2/3 of Barley seeds<br>(50% cover percentage).....          | 47        |
| 4.2.6. The Chemical analysis of some seeds and grains.....                                              | 49        |
| 4.2.7. The Chemical analysis of the rice straw that has been<br>used in all abovetrials.....            | 50        |
| 4.2.8. The Chemical analysis of the rice straw that has been<br>used in all below trials.....           | 51        |
| 4.3. The trial of reducing the amount of grains used.....                                               | 51        |
| 4.4. ZAD effect on orange pulp - rice straw mixture.....                                                | 53        |
| 4.5. Effect of the reduction of enzyme and water amounts.....                                           | 55        |
| 4.6. Widely adopted experiment (Chemical composition of                                                 | 58        |

|                                                                                         |           |
|-----------------------------------------------------------------------------------------|-----------|
| feeding rations).....                                                                   |           |
| 4.7. Rumen parameters.....                                                              | 59        |
| 4.7.1. Ruminal pH.....                                                                  | 59        |
| 4.7.2. Ruminal ammonia-N concentration.....                                             | 60        |
| 4.7.3. Ruminal total volatile fatty acids (TVFA's).....                                 | 60        |
| 4.8. Blood plasma parameters.....                                                       | 61        |
| 4.8.1. Plasma total protein (PTP).....                                                  | 61        |
| 4.8.2. Plasma urea concentration.....                                                   | 61        |
| 4.8.3. Plasma creatinine.....                                                           | 62        |
| 4.8.4. Plasma ALT and plasma AST.....                                                   | 63        |
| 4.8.5. Plasma total lipids.....                                                         | 64        |
| 4.9. In-vivo and In-vitro DMD (Effect of treatments on nutrients<br>digestibility)..... | 65        |
| 4.9.1. Effect of observed treatments on In vitro DM disappearance<br>(IVDMD).....       | 67        |
| <b>5. SUMMARY AND CONCLUSION.....</b>                                                   | <b>68</b> |
| <b>6. REFERENCES.....</b>                                                               | <b>70</b> |
| <b>ARABIC SUMMARY.....</b>                                                              |           |

## List of tables

| Table                                                                                       | Page |
|---------------------------------------------------------------------------------------------|------|
| 1 Chemical composition of rations                                                           | 35   |
| 2 Effect of boiling and soaked water and ZAD on the chemical composition of rice straw..... | 43   |
| 3 Chemical composition of whole plant +rice straw media.....                                | 44   |
| 4 Chemical composition of stems and the leaves of the fenugreek plants.....                 | 45   |
| 5 Chemical composition of the root + rice straw media                                       | 46   |
| 6 Chemical composition of whole fenugreek plants +rice straw media.....                     | 46   |
| 7 Chemical composition of stems and the leaves of the barely plants.....                    | 47   |
| 8 Chemical composition of the barely root + rice straw media.                               | 48   |
| 9 Chemical composition of barely whole plants +rice straw media.....                        | 49   |
| 10 Chemical composition of Canary grass whole plant +rice straw media.....                  | 50   |
| 11 Chemical composition of stems and the leaves of 1/3 fenugreek with 2/3 barley plants     | 51   |
| 12 Chemical composition of 1/3 fenugreek with 2/3 barley roots + rice straw media           | 51   |
| 13 Chemical composition of whole 1/3 fenugreek with 2/3 barley plants +rice straw media     | 52   |
| 14 Chemical composition of the seeds                                                        | 53   |
| 15 The chemical analysis of the rice straw that has been used in all above trials           | 53   |
| 16 Chemical composition of the rice straw that has been used in all below trials            | 54   |
| 17 Effect of the cover percentage (green part) on the leaves Chemical composition           | 55   |
| 18 Effect of the coverage percentage (root part) on the root                                | 55   |