

ISBN 1992-0903

MSUJSAT

Midlands State University Journal of Science, Agriculture and Technology



A Journal of the Midlands State University

Volume 2 - No.1 - 2010

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Published by:
Midlands State University
Private Bag 9055
Senga Road
Gweru
Zimbabwe
www.msu.ac.zw

Printed by:
Beta Print
Portland Road, H.I.S
P. O. Box 459
Gweru
Zimbabwe

Effect of Substituting Soyabean Meal with Industrially 'Detoxified' *Jatropha curcas* Meal on the Growth Performance of Weaned-fattening Pigs.

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Abstract

In a study of dietary effects of industrially processed *Jatropha curcas* meal (JCM) on Dry Matter Intake (DMI), Livemass Gain (LMG) and Average Daily Gain (ADG) of pigs, forty eight-week old (20 boars and 20 gilts) weaned Large White x Landrace cross breeds were used. The pigs were randomly allocated to five dietary treatments (D1, D2, D3, D4 and D5) ending up with four boars and four gilts per dietary treatment. Each pig was individually penned to serve as an experimental unit with mean pig weight per treatment being 16.19. \pm 2.1kg. Dietary treatments were both iso-nitrogenous and iso-calorific. Treatment diet one (D1) served as the control and had no JCM. The JCM in treatment diets D2 to D5 substituted 6.25 %, 12.5 %, 18.75 % and 25 % of the crude protein contribution of the soyabean meal (SBM) in the diets respectively. The five groups were fed twice daily on a restricted feeding regime starting at 1kg feed/pig/day increasing weekly by 100g. Water was available ad libitum from nipple drinkers. Daily feed intake and weekly body weight gains/losses were recorded for an initial (phase 1) four consecutive weeks. After phase 1 diets D2 through to D5 were withdrawn and animals initially on them were put on D1 while those on D1 continued. The changeover constituted phase 2. The trial continued for another four weeks. Both level of JCM inclusion in the diet and length of exposure to diet significantly ($P < 0.001$) reduced DMI, LMG and ADG. DMI ranged from 8.88 \pm 0.33 kg/pig/week, the highest ($P < 0.001$) for pigs on D1 (control) to 3.95 \pm 0.40 kg/pig/week for pigs on D5. LMG was highest ($P < 0.001$) at 4.01 \pm 0.23 kg/week for pigs on D1 but declined to minus 1.13 \pm 0.28 kg/week for pigs on D5. ADG was highest ($P < 0.05$) at 572.79 \pm 33.27 g/day for pigs on the control diet (D1) but declined to 89.95 \pm 35.81 g/day and -162.15 \pm 40.52 g/day for pigs on D2 and D5 respectively. An increase in JCM inclusion in the diet caused a marked decrease in pig growth performance. Upon withdrawal of JCM based diets, the negatively affected pigs recovered on the control diet indicating that the processing did not completely detoxify the JCM.

The effect of feed supplementation on reproductive performance and milk yield of cows in Irisvale smallholder farming area of Zimbabwe

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Abstract

The objective of the study was to investigate the effect of a low level of postpartum feed supplementation on reproductive performance and milk yield of cows of different breeds in Irisvale smallholder farming area. One hundred and twenty cows, mostly Sanga and Zebu type and their crosses, were used and monitored in the study over two seasons (1998–2000). At calving the cows were offered two dietary levels, a control diet and a supplementary diet of a 14% CP maize/soyabean-based commercial dairy meal at a rate of 2 kg/cow/d. Milk samples were collected from each cow three times a week and analysed for progesterone concentration using solid phase radioimmunoassay. Supplementary feeding reduced ($P < 0.05$) the interval from calving to ovulation from 132 ± 63 d to 102 ± 69 d, improved oestrus detection rate from 10% to 41%, increased conception rate from 30% to 69%, and increased calving rate from 27% to 61%. Supplementary feeding also improved mean daily milk production from 1.3 ± 0.5 kg to 3.3 ± 1.3 kg. These results indicate that low levels of supplementary feeding can improve reproductive performance and milk production of cows in smallholder farming areas of Zimbabwe.

Sustainable rangeland resource management in the semi-arid communal areas of Zimbabwe: I. An analysis of some critical constraints

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Abstract

Ecological degradation is suggested in the rangelands particularly in the semi-arid communal areas of Zimbabwe. This is largely attributed to improper grazing management that is aggravated by factors incidental to an agro-ecologically inappropriate farming system. There is need to institute land reforms and rural development programmes that facilitate land use options that broaden the economic activities and incomes of communities, thus reducing the exploitative use of the grazing lands. In the long run, sustainable utilisation of the rangeland resource should hinge on a holistic approach that recognises that land is a finite resource and its sustainable use must be tied to economic development in non-agricultural sectors that will help alleviate population pressure on the land resource.

Sustainable rangeland resource management in the semi-arid communal areas of Zimbabwe: II. New opportunities in sustainable management

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Abstract

Rangeland management initiatives in the semi-arid communal areas of Zimbabwe have over the years apparently failed to achieve any measurable trend towards sustainable rangeland management. There is a growing view that the ecological and socio-economic paradigms that have guided these initiatives need to be revisited. Rangeland scientists are increasingly in favour of adopting alternative 'opportunistic' rangeland resource utilisation and assessment models that fully conform to the unique dynamics of semi-arid ecosystems, while socio-economists are also revisiting traditional common access resource management approaches. There is growing consensus that there should be a new drive in research on approaches in sustainable communal rangeland management.

A Review of The Importance of Genotype x Environmental Interactions in animal breeding.

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Abstract

The genotype x environment interaction occurs when the difference in phenotypic variance of two or more genotypes differ from one environment to another. Or when the difference in the phenotypic variance occurs in two or more environments between two or more genotypes. This points to different genotypes showing differences in sensitivity to environmental differences. There are theoretically four forms of the genotype x environment interactions. Only those involving small genetic and large environmental differences and those among large genetic and large environmental differences are of importance to the animal breeder. These interactions may involve the change in rank order or simply a change in the magnitude of the differences. There has been a lot of work on genotype x environment interactions. Significant and economically important genotype x environment interactions have implications in animal breeding, especially in situations where there are differences in the breeding and production environments. The genotype x environment interactions have an impact on the results of different mating systems, where they make it difficult to detect direction of the change in the inbreeding depression, the level of heterosis and response to selection. This may call for the maintenance of different breeds each suited to its environment. There may be need to standardize the genetic evaluation of animals in different countries or regions. There is little information on the genotype x environment interactions in natural populations of animals. This information is particularly important especially in situations where conservation of endangered populations involve breeding wild animals in captivity and reintroductions.

Soil fertility status and farmer perceptions on soil acidity in Chendambuya smallholder farming area, Zimbabwe

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Abstract

Soil fertility has been identified as one of the major biophysical constraints to crop production in high rainfall smallholder areas of Zimbabwe. A survey was conducted in 2002 to assess the extent of soil acidity and its management in Chendambuya smallholder area (ave. rainfall 750-1000 mm per annum) in eastern Zimbabwe. A structured questionnaire was administered to 100 households, selected after a wealth ranking exercise, in order to determine how farmers managed soil acidity. Soil, organics (cattle manure and composts) and termitaria samples were also taken for chemical analysis. Soils in Chendambuya are predominantly sandy soils derived from granite, and red clay soils derived from dolerite cover less than 1% of the area. Most of the households (94%) owned cattle but the average herd size was low (9 per household) and cattle manure was applied at an average rate of 5.3 t/ha. The majority of the households (98%) used fertilizer but only 7% used agricultural lime. Most farmers were aware of the problem of soil acidity and attributed it to use of acidifying fertilizer (12.1%), nutrient depletion (16.2%), extended periods of cultivation (16.2%), over-cultivation (22.2%) and type of soil (6.1%). Chemical analysis of manure samples showed that the neutralizing value (liming capacity) was variable (6.2-75.9%) with an average of 36.7%. Soil content in the manure was high (ave. 56%). Soil analysis results showed that the soils were acidic (ave. 4.4 CaCl₂) with 75% of the soils having pH values of 3.2-4.7. It was concluded that the quantity and quality of cattle manure available to the farmers, and the extent of lime use, were too low to control soil acidity. There is therefore need to develop crop varieties that are tolerant to soil acidity as well as to promote the use of lime in the smallholder farming areas located in high rainfall areas, especially where N fertilizer is used.

Opportunities and constraints of using runoff water in semi-arid Zimbabwe: An exploratory survey in Musikavanhu communal lands.

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Abstract

Musikavanhu communal area lies in semi-arid Zimbabwe below a range of mountains to the east. The mountains have more raindays and receive more rainfall than Musikavanhu, resulting in Musikavanhu communal area receiving runoff, not only when there is localised rains but also on those occasions when it rains in the mountains. An exploratory survey was conducted in Musikavanhu communal area in 1992 (during the dry season) to identify the uses with which farmers make of foreign run-off water from the mountain range. A structured interview schedule was administered to 21 farmers or groups of farmers who are using or have used runoff water before. The area studied can be divided into three zones according to the characteristics of run-off water. These are foothill, midstream and downstream. All farmers in the survey showed a keen awareness of run-off water which passed through their farms and were knowledgeable as regards the frequency of runoff, sources and destinations of run-off, and its effects on crops and the land. Some have tried to make use of this run-off water by small diversion schemes which have met with varying degrees of success and failure (depending on the zone), while others see the potential but have been unable and/or unwilling to harness it due to lack of resources or technical know-how. Most of the cases of successful use of foreign runoff were found in the downstream zone where water from the streams/gullies breaks and spreads naturally to benefit the crops in the fields. Runoff water in the midstream zone can be safely used if the extension agent provides technical assistance to these farmers.

An investigation into the efficiency of sewage treatment at Midlands State University, Gweru, Zimbabwe

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Abstract

A study was carried out to assess the efficiency of sewage management techniques and effectiveness of sewage treatment at the Midlands State University's two sets of oxidation ponds. Parameters assessed included Biological Oxygen Demand (BOD), total faecal coliforms, total solids, nitrates, conductivity and pH. Questionnaires were distributed to the authorities to complement laboratory and onsite tests. Variations were noted in most effluent parameters before and after treatment as well as during term and vacation periods. There was an average reduction of 75.5 % and 65.5 % in BOD in set B ponds during vacation and term respectively. These variations were attributed to student population. BOD reduction in set A was not ascertained since there was no effluent discharged from the pond. Faecal coliforms (3.18×10^3), total solids (253.93 mg/L) and conductivity (387.4 $\mu\text{S/cm}$) of the released effluent were above the upper limits of Zimbabwe National Water Authority's (ZINWA's) blue sensitive range. General maintenance of the ponds was not satisfactory especially for set B. This was even reflected by the differences in performance of the 2 sets with set A being more efficient in treatment than set B. Receiving ponds in set B were choked with alien plants. Overall, there is need to implement environmental management policies and improvement of the sewage handling facilities as the current system cannot cope with the surging student population. Alternatively the institute can abandon handling its own effluent and connect to the Gweru City Council's sewer system.

A survey of *Schistosoma* and *Plasmodium* infections in Gweru Area

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Abstract

A survey of Schistosoma and Plasmodium infections in Gweru area was carried out in 2003. The incidence of Schistosoma infections were highest in the 5-14 years age group. The prevalences of S. haematobium and S. mansoni were 82% and 18% respectively. The total number of cases of malaria in the above 15 years age group were significantly higher than those in the under 5 years and 5-14 years age groups ($P < 0.05$). The prevalence of P. falciparum was 83% and that of P. malariae was 17%. Malaria cases were recorded throughout the year. The findings of the survey are discussed in relation to health and social implications.

General Guidelines to Authors

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Abstract (Papers must contain an abstract briefly summarising the essential contents: the abstract should not normally exceed 300 words)

Introduction

Materials studied, area description, methods and techniques

Results

Discussion

Conclusion

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