

Birds fed diets A_{0.2}, A_{0.4} and M_{0.2} had a significantly ($P < 0.05$) higher live body weight and body weight gain when compared with all the other groups. The highest weight gain was recorded with birds fed the 1/1 mixture of charcoal A and B at 0.2% inclusion in diet as compared with 0.4% inclusion. However, the inclusion of 0.2% charcoal B and 0.4% of mixture in the diet significantly ($P < 0.05$) increased feed conversion ratio. Birds from treatments C+ and M_{0.4} had smaller intestine weight and intestine density as compared with the birds from all other treatments. Carcass yield, relative weight of heart and abdominal fat were not significantly affected ($P > 0.05$) by the treatments. Both charcoal A and B significantly ($P < 0.05$) yielded smaller liver weight as compared with C+. The highest pancreas weight was recorded in birds fed C- (0.20 g) as compared with the birds fed any other diet (0.13–0.18 g).

Conclusion

It was concluded that up to 0.4% of maize cob charcoal and 0.2% of a 1/1 mixture of charcoal from *Canarium schweinfurthii* seed and maize cob could be used as feed additive to absorb aflatoxin B₁ and promote growth performance of broiler chickens.

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Tables of nutritive value for farm animals in tropical and Mediterranean regions: an important asset for improving the use of local feed resources

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Introduction

The management of feed resources is of paramount importance and requires accurate feed values. Tables of feed composition and nutritive value are used to formulate diets that meet animal requirements at the lowest cost, thereby improving production results and farm productivity. In emerging and developing countries, and particularly those in tropical, subtropical and Mediterranean areas, the demand for animal products has been steadily growing in the past decades. There is thus a growing need for accurate feed information. However, even though many research data are published every year, they are rarely summarized in an easily available form, and users in these regions must often rely on data obtained in temperate countries or use obsolete or incomplete sources.

The Tables of nutritive values for farm animals in tropical and Mediterranean regions is a project of INRA (Institut national de la recherche agronomique), CIRAD (Centre de coopération internationale en recherche agronomique pour le développement) and AFZ (Association française de zootechnie), with partial support from the FAO and the help of other organisations. The project's goal is to produce comprehensive tables for feed users in these areas. The tables will include nutritional information for both conventional and non-conventional feed materials for the main livestock species. They are planned for release in 2013, either in paper or electronic form.

Objectives

The main objective is to create a compendium of up-to-date information on feed materials available to users in tropical, subtropical and Mediterranean regions. The project focuses on the following information:

Feed nomenclature and descriptions: names, physical aspect (including pictures), availability, processes and environmental impact.

Composition and nutritive values derived from feed databases and scientific literature.

Recommendations by livestock species, including cautionary information.

For local users, the benefits should be as follows:

- Better identification, qualification and quantification of local feed resources.
- Better awareness of potential synergies between local food industries and livestock production.
- Better use of local feed resources and less reliance on imported techniques and feed materials.
- In the near future, it will be also possible to use the tables' framework for quantitative environmental data.

For researchers, the tables should:

- Provide a comprehensive set of models of relationships between composition and nutrition parameters.
- Help to promote collaboration between teams working on tropical and Mediterranean animal feeding.
- Help to identify areas where knowledge is lacking so that experiments can be set up to generate new data.
- Promote research on biological response curves for animal production in the tropics.

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Methodology

For each feed material or family of feed materials, we will use the following methodology:

- Research and identification of relevant databases and scientific literature.
- Collection of quantitative and qualitative feed data.
- Summarizing of quantitative information.
- Establishing representative and consistent vectors of chemical and nutritive values.

For large families of feedstuffs, the methods of meta-analysis will be used.

The project is managed through a collaborative website that is editable on-line by the contributors. Another database contains the composition and nutritive data, as well as the equations and calculation processes.

Current results

- A database containing more than 2 million raw data has already been established.
- Specifications have been drawn up for researching information and writing datasheets.
- Collaborations have begun with the Gembloux AgroBioTech (Belgium), the Hassan II Institute (Morocco) and the University of Cordoba (Spain). Other institutions are interested in participating.
- A first batch of 50 datasheets was produced in 2009.

To be done

- Establishing a formal methodology for calculating final tables values.
- Generation of approximately 200 datasheets per year over the next 3 years.
- Finding new partners in other countries in order to increase the width of both data collection and expertise.
- Production of the final tables.

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Lower temperature profile and less aflatoxin on corn silage covered by oxygen barrier plastic film

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Introduction

The establishment of anaerobic conditions in silage is important to avoid the growth of aerobic microorganisms. Nevertheless, the silage stored in horizontal silos, which are exposed to air are prone to aerobic deterioration, mainly in the upper layer of those silos (Ashbell and Lisker, 1988). The plastic sheet used to cover silage has oxygen permeability and small amounts of air will penetrate the silage. In this way, aerobic microorganisms will consume reserves, resulting in losses of DM, development of pathogenic species (Borreani and Tabacco, 2008), and production of mycotoxins (Garon *et al.*, 2006). The objective of this research was to study several sealing methods to reduce the top losses in corn silage.

Materials and Methods

The treatments evaluated consisted of three factors: plastic sheet (black-on-white polyethylene (PE) film with 200 μm thick or black-on-white coextruded polyethylene-polyamide – oxygen barrier (OB) film with 125 μm thick); bacterial or chemical additives applied onto the top of the silos (control, *Lactobacillus buchneri* 1×10^6 cfu/g forage¹ and sodium benzoate 0.02% wet weight basis); addition of a soil layer (100 kg/m²) over the external surface of the plastic sheets. Forage was ensiled (30–35% DM) into macro experimental silos made on cement, containing 500 litres and cylindrical in shape (1.04 m² working area) which were packed by feet to reach 300 kg. During the ensiling one plastic bag with well-mixed chopped forage (approximately 4 kg of fresh weight bag⁻¹) and one data logger were buried into the upper layer (25 cm depth) of the silo. The plastic films were adjusted on the top of the silos and were fixed with adhesive tape and the silos were stored in an open field. The bags and data loggers were removed from the silos for analysis 90 days after ensiling. The quality of the sealing method was assessed by temperature measurements and top losses in the silages were also determined by chemical and microbiological analyses. Effects of treatments were analyzed according to a randomized design over the experimental units by using the MIXED procedure and the statistical significance was declared at the 5% level.

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