



THE OPPORTUNITY OF VETIVER GRASS AS FEED ADDITIVE

(Review)

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INTRODUCTION

Genus: *Vetiveria* → 11 species

Vetiveria zizanioides (L) Nash or *Andropogon zizanioides* (Skerman & Riveros, 1990).

Common name:

Khas-khas grass – Africa

Vetiver – Europe

Khus-khus, khas, cus-cus - India

Usar, akar wangi, lara setu – Indonesia

Narawastu – Malaysia

Vetiver has multiple uses:

Material for roofing, fencing, shedding, firewood, medicinal herbs, soil conservation,, perfume industry, handicraft, and forage.

Indonesia:

Perfume materials, cosmetics, fragrance soaps, anti inflammation, repellent, insecticidal agents (Kadarohman *et al.*, 2014).

Vetiver grass in Garut (West Java, Indonesia) has contributed to 89% of the vetiver production In Indonesia.

The world's main vetiver oil producers :

India, China, Indonesia, Haiti and Reunion Island (Arctander, 1960).

Vetiver oil exporter:

Indonesia is the second largest country in the world after Haiti, and the first after the earthquake in Haiti in 2010 (Kadarohman *et al.* 2014).

In the world market known as:

'Java Vetiver Oil' has strong aroma fixation, and used in the perfume industry, cosmetic, aroma therapy and fragrance soap (Mulyono *et al.* 2012).

Vetiver is used also as a relaxant for the nervous system, lower heart rate, normalizes breathing, anti-inflammatory properties, controls diabetes and cures skin diseases (Chia, 2002).

The bacteria in the vetiver roots transform these compounds (pheromones and hormones) into the complex variety of constituents found in vetiver that have insecticidal, antimicrobial, and antioxidant properties (Peterson, 2014).

Vetiver as Livestock Feed

Vetiver can be used as fodder if it is managed correct.

1. Double tiller of vetiver is better than single or triple tiller (Moula and Rahman, 2008).
2. Vetiver is cut every 2 weeks to be edible forage, high nutritive value for cattle and goats (Liu&Cheng, 2002, Falola *et al.*, 2013)).
3. Vetiver fertilized by pig manure has CP, carotene and lutein contents higher (Xu *et al.*, 2003).
4. Vetiver can be used as ruminant feed (silage/ hay) if it's mixed with other good quality feed and forages (Fan & Sauer, 1995; Balasankar *et al.*, 2013).

However, so far, little is known on the application of vetiver grass as feed for ruminants and poultry (Liu & Cheng, 2002).



Vetiver as Feed Additive

Antibiotics (ANTs) have been extensively used worldwide as growth promoters in animal feeds, particularly in poultry and pig production.

However the use of ANTs are harmful to humans by development of microbial resistance to these products (Greathead, 2003)

Resistant bacteria can travel from the farm in air or water, can wind up in the soil when manure is applied to crops (Cordova & Kar, 2014).

Several alternatives to antibiotics growth promoters have been proposed, such as organic acids, herbs and herbal product (Banerjee *et al.*, 2013).

Herbal feed additive, also called phytobiotics are commonly defined as plant-derived compounds incorporated into diets to improve the productivity of livestock (Subba, 2013), and reduce the pathogenic bacteriological load in duodenum (Subha, 2013).

These trends have created an industrial demand for ANT replacements such as herbal essential oils (Hertrampf, 2001)



Essential oils from *Poaceae* (grass family) can be considered as promising future candidate food or feed supplement and good sources of natural antioxidants (Saleh *et al.*, 2010).

Vetiver oil has over 150 compounds and a major portion of oil consist of sesquiterpenoide, hydrocarbons , phytochemical, and screening of the powdered leaves shows the presence of alkaloids, flavonoids, tannins, phenols, terpenoids and saponins (Snigda *et al.*, 2013).

Vetiver oil also reported high antibacterial activity against drug resistant strains of *E. coli* (Luqman *et al.*, 2005).

Vetiver exhibited good antifungal activity at concentrations of about 200 ppm against *Aspergillus fumigatus*, *Candida albicans* etc (Peterson, 2014).

However, applications of phytogetic feed additives to livestock also has to be safe to the animal, the user, the consumer of animal product and the environment.

There is still a need for a systematic approach to explain the efficacy and mode of action for each type and dose of active compound, as well as its possible interactions with other feed ingredients.



Conclusion

Vetiver essential oil can be considered as promising future candidate feed supplement and good resource of natural antioxidants, and also has good opportunity as feed additive to solve problems in livestock nutrition and production.

THANK YOU

