Effect of Adding Lemon Grass to Dairy Cow Diets on Milk Quality and Blood Oxidation Resistance

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Introduction Lemon grass (*Cymbopogon citratus*) , a native grass of India , is a tall tropical grass . The plant grows in dense clumps up to 2 meters in diameter and has leaves up to 1 meter long . The fresh stalks and leaves have a clean lemon like odor because they contain an essential oil , which is also present in lemon peel . Lemon grass is a perennial tufted grass with long , sharp-edged blades . It grows in dense clumps in tropical or subtropical climates . In traditional medicine , lemon grass is used for the cure of some infectious illnesses and fever . The benefits derived from lemon grass are that it clears confusion , lessens stress and reduces mental fatigue . Other medicinal properties of lemongrass include its use as an antiseptic agent , astringent bactericide , insecticide and fungicide . It can be used as an antiseptic wash or as a compress on skin infections such as ringworm and infected sores . It can also be taken as an anti-oxidant as well as to assist the process of digestion . As lemon grass can be easily produced in large quantity whether it can be used to feed dairy cow and in the process improve milk flavor or cow health merits research .

Material and methods Lemon grass was dried and grinded to powder . Four dairy cows were chosen and randomly divided into 2 groups : a treatment group and a control group . The treatment group was fed a ration containing 1 .5 kg powder of lemongrass per day and the control group fed the same ration except without lemon grass . The feed experiment lasted for 20 days . Three days after feeding with lemongrass powder , the milk was sampled every day , and the milk quantity and quality were checked and analyzed , and the anti-oxidation of the blood determined .

Results Fed with lemon grass , there was no significant influence on milk production , and no abnormality was found in the dairy cows . The results indicated that by adding lemon grass hay 1 .5kg/d per cow , the milk fat , milk protein , lactose , dry matter and non-fat dry matter content changed little and there was no significant difference between the treatment and control (Table 1) . Fed with lemon grass , the cow blood antioxidant capacity improved ,serum SOD and GSH-Px activity significantly increased ($P<0.05$) and MDA decreased (Table 2) . By HPLC , citral can be detected in milk ; the concentration of citral was 0 . 211$\mu g kg^{-1}$. Lemon grass has rich aromas and so can also reduce the bad odor in cowsheds .

Table 1 *Effect of adding lemongrass on milk quality .(%)*

Group	Dry matter	Milk fat	Lactoprotein	Lactose	Non-fat dry matter
Control	11 .82	3 .69	3 .05	4 .26	7 .95
Treatment	12 .05	3 .52	3 .21	4 .59	8 .58

Table 2 *Effect of feeding lemongrass on the anti-oxidation of milk cow blood serum .*

Group	SOD($U \cdot ml^{-1}$)	GSH-PX($U \cdot ml^{-1}$)	MDA($nmol \cdot ml^{-1}$)
Control	109 .27	175 .62	4 .28
Treatment	121 .14	187 .86	3 .94

Conclusions Lemon grass can be used in the diet of dairy cow without affecting milk production . It can improve the health of dairy cows . Lemon grass contains rich natural citral which can be transferred to milk and improve the milk flavor . Aroma of high concentration citral can also reduce the bad odor in cowsheds

References

Adegoke G O , Odesola B A . Storage of maize and cowpea and inhibition of microbial agents of biodeterioration using the powder and essential oil of lemon grass(Cymbopogon citratus) [J] .*International Biodeteriotation & Biodegradation* . 1996 , 37(1-2) :81-84 .

Wannissom B , Jarikasem S , Soontomtanasart T . Antifungal activity of lemon grass oil and lemon grass cream [J] . *Phytotherapy Research* . 1996 , 10(7) : 551-554 .

Vinitketkumnuen U , Puatanachokchai R , Lertprasertsuke N ,*et al* .Volume Antimutagenicity and Anti-tumor activity of lemon grass[J] . *Research/Environmental Mutagenesis and Related Subjects* ,1996 ,359(3-4) :200-201 .