



# Control of *Leucaena toxicosis* in Myanmar sheep using IBT- Göttinger Bioreactor grown mimosine degrading ruminal *Klebsiella spp.*



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## *Leucaena leucocephala*

- ❖ -Tropical leguminous plant.
- ❖ The use of leucaena: source of firewood, timber, soil erosion, control, provide shade for other plants, feed forage for ruminants
- ❖ It contains up to 30% CP.
- ❖ in Myanmar, it is used as protein source in UMMB for ruminants.

But,

- ❖ It contains toxic, non-protein amino acid, mimosine,
- ❖ Mimosine and its metabolite 3,4-DHP are toxic to animals.
- ❖ Biological solution was hypothesized to prevent
- ❖ leucaena toxicosis by using ruminal bacteria

## Objectives

- ❖ Develop, multiply and isolate mimosine degrading ruminal *Klebsiella spp* by using IBT-Göttinger Bioreactor
- ❖ Control mimosine toxicosis by using these bacteria

## Methods

- ❖ Mimosine degrading bacteria was developed and selected (\*Aung *et al.*, 2006)
- ❖ The bacteria were identified by using PCR and gene sequencing showing those bacteria were *Klebsiella spp.*
- ❖ These ruminal *Klebsiella* were multiplied by using IBT-Göttinger Bioreactor and entrapped in sodium alginate beads

## Experiment

- ❖ Animals: 12 Myanmar sheep in 4 groups
  - Group I : untreated control
  - Group II : treated control
  - Group III : inoculated with bacteria once at the beginning
  - Group IV : Inoculated for 14 days continuously
- Experimental design : CRD

## Experimental period

- ❖ Preliminary period - 7 days
- ❖ Feeding trial - 16 days
- ❖ Collection period - 5 days

## Observations

- ❖ Body Temperature
- ❖ Clinical symptoms of leucaena toxicosis
- ❖ Voluntary intake
- ❖ Digestibilities and TDN intake

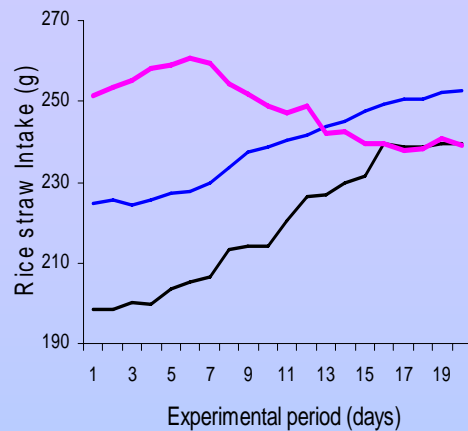
## Results

- ❖ Clinical signs of leucaena toxicosis (Group II) can be seen in Fig 1
- ❖ Body temperature of the sheep
  - group II - 39.3-40.6 °C
  - other groups - 38 to 38.9 °C
- ❖ Rice straw intake of those animals can be seen in Fig. 2



Fig. 1 Sheep showing clinical sings of leucaena toxicosis

- ❖ The mean value of TDN intake (g/ d/ kg BW0.75 )
  - group II -0.5
  - group I -0.89
  - group III -0.79
  - group IV -0.8



— Group I, — Group II, — Group III & IV  
Fig. 2 Comparison of rice straw intake

## Conclusion

IBT-Göttinger Bioreactor grown ruminal *Klebsiella* can show *in vivo* degradation of mimosine when they are used as DFM after entrapped in alginate beads.

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\*Aung, A., U. ter Meulen and H. Böhnelt, 2006. An attempt to isolate and produce mimosine degrading rumen bacteria from German steers by using IBT-Göttinger Bioreactor. Abstract. Deutsche Veterinärmedizinische Gesellschaft e.V. Tagung der Fachgruppe „ Bakteriologie und Mykologie“ 15-17. Juni 2006, Wetzlar. pp. 89