PRELIMINARY RESEARCH ON EFFECTIVE MICROORGANISMS IN ANIMAL PRODUCTION

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Abstract

The benefits of using Effective Microorganisms (EM) in animal production program was tested at the Hanoi Zoological Gardens. EM was used in professional dog houses, chicken pens, dairy herds and many other animal units. The studies illustrate that EM increased the resistance of animals to diseases and was very effective in controlling odor. The latter was the most promising aspect of EM in the Hanoi Zoo. Due to he success of these projects, the Hanoi Agricultural University has undertaken many training projects with EM. Students and farmers are being trained on the use of this technology in agricultural enterprises. The presentation highlights these projects.

Introduction

Vietnam is a tropical country. The total area of the country is 332,000 km^2 and is densely populated. Agriculture is based mainly on rice production, supported by other crops such us maize, potato, sweet potato, cassava....., livestock production forms 25 % of the agricultural output value.

Traditional farming is based on an integrated system of rice, root crops, fruit trees, vegetable, livestock and poultry. New integrated system known as VAC links the garden (Crops)- the pond (fish) and the shed (animal). This integration have brought more income for rural small holders. With large - scale animal raising, the management and treatment of noxious gases and odor formed from floors, stored wastes and animal slurry has become a major problem for resolve. In view the potential application of EM to resolve these problems, HAU have carried out some experiment in the area of animal husbandry & health. This paper are some preliminary results of EM in this field.

2. Experiments:

2.1. Study the effect of EM on poultry production:

2.1.1. Experiment procedure:

a) Estimated daily dry matter in chicken is wasted: Laying hens and broilers.

b) One experiment is conducted to determine the effectiveness of adding EM to the drinking water.

200 broiler breeder hens were divided in two groups:

- Treatment birds: mixing EM1 1/1000 in drinking water and the EM solution was sprayed on deep-litter and the walls.

- Control birds

The preliminary results:

a) Daily dry matter in chicken manure (Table 1)

Table1: Daily dry matter in chicken manure

Class	Live body weight (g)	Dry matter intake (g)	Manure dry matter is wasted (g)
Laying hens	1,900	120	*30
Broilers	800	90	**12

*Digestibility : 75%

** Digestibility : 80%

b) EM effect on broiler breeder hens (Table 2)

The preliminary results indicated that: average egg production for the seven weeks period (summer season) following treatment with EM1 was significantly higher, eliminated the incidence of diarrhea and odors of chicken house is minimized for birds supplemented EM1 in drinking water compared to the control birds.

Table 2. EM effect on broiler breeder hens production

	Treatment birds (+EM1)	Control birds
Egg production (%)	66.1	63.5
Deformed eggs (%)	1.0	5.0
Incidence of diarrhea (%)	no present	some birds
Odors of chicken house	minimized	noxious gases and odors

2.2. Using EM for professional dog house:

The professional dog center has been raised 100 male and female pure-bred dogs, these dogs are trained for the police. Before using EM, the odors formed from dog houses is smelling bad. After the application of EM secondary solution 1:300; 1 litter/m^2, that odor has been eliminated.

2.3. Application of EM for Hanoi Zoological garden (Hanoi Zoo):

Hanoi Zoo was founded in 1976 with 11,870 square meter of cage space, 60,000 m^2 of lawn, 17,000 m^2 of flower beds, 19,000 m^2 of pathways, 10 ha of water lake and 8,573 trees and has principal responsibilities:

The preservation and conservation of rare animal species. Today, the Hanoi Zoo is raising to around 800 animal of 90 different species.

Providing an atmosphere where the people can visit to relax and learn about animal. Many animal species cared at Hanoi Zoo are listed in the Red Data Book for Vietnam. These species include the Indochina Tiger, Clouded leopard, Vietnam Pheasant ....

Noxious gases and odors formatted from floors of animal confinement building, stored wastes

and animal manure can be irritating to both the animal and the animal attendants and have been the cause of numerous complaints by visitants.

Hanoi Zoo has to apply the appropriate disinfectant to the floors, walls... Nowadays the chemical are too expensive or not available then at beginning of September, HAU have realized some applications of EM in Hanoi Zoo.

The firth application of EM is realized in *Nyctereutes procyonnoides* house: Secondary solutions were diluted 1:300 and applied once every 3 days. The Offensive odors coming from *Nyctereutes procyonnoides* house were successfully eliminated for 15 days after treatment. At present, the application of EM have extended to the houses of Elephant, Sika deer, Sambar deer and some other areas of Hanoi Zoo.

2.4. Using of EM for dairy cows:

Raising dairy cattle in Vietnam has developed since 1959 mainly on government farms. In recent years it has expanded rapidly in the small farms in Hanoi countryside and Ho Chi Minh city. The total number of dairy cows in Vietnam is about 18000 head, about 80 % of them on small holder farms.

Manure present the greatest waste management problem to all dairy farmers. A 100 milking cows herd with replacement stock typically produces about 9000 liters of manure each day (Radostits, Leslie, Fetrow, 1 994).

Dust, noxious gases and odors formed from manure stored have been the cause of an increased incidence of environmental diarrhea, of numerous complaints and litigation’s by neighbors. In order to resolve of this problem with EM technologies, our research team have selected 5 dairy farmers at Phu Dong communes, Gia Lam district, Hanoi capital (the average number of cows raised per farmer is 2 cattle).

The ratio of EM concentration was used is 1:200 and applied once every 5 days in the floor during September when the heat intensified decomposition. After 15 days application of EM solution, the noxious gases and offensive odors can be controlled and eliminated. The incidence of diarrhea was decreased. Nowadays, many farmers use EM solution 1:300-500 ratio is said to be quite effective and they have used for pig slurry and have the same results.

3. Training activities:

At present, Hanoi Agricultural University is one of the most important center for training and transfer of technology related to EM using for student, scientists technicians of extension center from many provinces.

During the November, 1997 HAU research team have realized 10 short training courses, at which some 300 participants.

4. Conclusions:

Preliminary results on EM application for Animal Husbandry at Hanoi Agricultural University

have confirmed the positive and diverse effects of EM technology on wide range of different field researches.

4.1. Use of EM for broiler breeder hens:

Average egg production following treatment with EM1 was significantly higher, eliminated the incidence of diarrhea and odors of chicken house is minimized for birds supplemented EM1 in drinking water.

4.2. Problems dust, noxious gases and odors formed from manure, wasted water ..... of animal house at Hanoi Zoo, professional dogs center, dairy cattle farmers can resolve effectively by EM technology.