2-3 Summary of Meeting/Field trip

- **Utilization of Food Waste for Agricultural Applications on the Pacific Island of Guam**

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Dates: 10/12/12 to 10/15/12
Location: University of Okayama, Okayama Japan

The aim of the meeting was to further develop the joint project between Okayama University and University of Guam on "Utilization of Food Waste for Agricultural Applications on the Pacific Island of Guam," as a part of the "Practical Research and Education of Solid Waste Management Based on Partnership Program between Universities and Governments in Asia and Pacific Countries" project.

Participants:

a. University of Guam
   Dr. Mari Marutani, Professor of Horticulture and Sustainable Agriculture (co-PI)
   Dr. Hauhouot Diambra Odi, Educational and Agricultural Consultant and Animal Scientist
b. Okayama University
   Dr. Yukitaka Kimura, Professor of Environmental Process Engineering (co-PI)
   Ms. Saori Hoshijima, Undergraduate student, Environmental Process Engineering
   Mr. Daisuke Miyaji, Agricultural Technician, College of Agriculture

Objectives:

1. To discuss the details of experiments to produce fermented chicken feeds using locally available food waste materials at the Okayama University and the University of Guam.
2. To visit facilities near Okayama to learn organic agriculture and fermentation methods, and animal husbandry.

Outcomes:

1. From our discussion, we have decided to conduct experiments to produce fermented feed for chicken layers at both Japan and Guam using locally available food waste materials during the 3rd year of the project.

   At the Okayama University, the proposed base materials for a fermentation experiment will be a mixture of rice hulls, rice bran, and microorganisms with white mycelia taken from the root zone of a local bamboo bush. Various food waste materials such as lettuce will be added to examine the fermentation process and the final products as chicken feeds. The main parameters examined will be temperature, humidity, pH and the content of organic acids during fermentation. Also DNA profiles of active microorganisms during fermentation will be revealed.

   At the University of Guam, the main ingredients of fermented chicken will be spent grain, a by-product from brewing beer at a local restaurant. The spent grains contain yeast and other

c. **Manabe Poultry Farm with conventional caged egg-layering system in Takamatsu (10/13/12)**

The Manabe Farm has 30,000 layers with automated feeder, egg packing and manure processing. Commercial feed was used and about 7,000 120-day old pullets were purchased each time. Two full time employees (husband and wife) and two part-time employees operate the farm. There was a pasteurization (80°C)/fermentation equipment at the farm which was used to process cracked eggs, dead birds, and other green materials from Manabe's Orchid Farm (same owner) incorporated with commercial EMs (effective microorganisms).

d. **Ohkura Farm and Ichimonji Noodle Shop in Seto City, Okayama (10/14/12)**

Mr. Ohkura grows rice and wheat organically and also runs a noodle shop using his agricultural products. Ducks were used for weeding and fertilizing both the rice and wheat fields. Mr. Ohkura mixed his own bird feeds using a mixer and a pelletizer (Kanpere kun, Taiwa Co.). Ingredients of homemade duck feeds included crushed and powdered low-grade rice, rice and wheat bran, and other food wastes. As a new attempt, rice silage was made this year and will be tried as duck feed. In addition to rice and wheat grains from the farm, about 800 ducks per year are sold as premium meat at restaurants.

e. **Rural Caprine Farm in Okayama (10/14/12)**

This goat farm is a multi-functional operation. The farm is open to all visitors for free as a petting zoo. The farm also produces goat milk, yogurt, pudding, cheese, ice cream, soaps, and etc. The Kobayashi family operated farm with 100+ goats and has developed many value-added products using goat milk. Cheese is made at the farm through the process of sterilization (80°C for 5 min.), fermentation (43°C for 6 hours), heating (55°), cooling (5°), draining (4°C for 4 days). Composting was also done as part of farm products using rice hulls.

The field trips were very informative and enjoyable. Knowledge gained from the visit will be utilized to further develop our program and deliverables including lectures and seminars in the near future.