

Use of separated solids from livestock slurry

PIG SLURRY is separated by using a run-down screen separator. Reductions of total solids (TTS), total volatile solids (TVS), total suspended solids (TSS), total Kjeldahl nitrogen (TKN) and chemical oxygen demand (COD) after solid separation were 28.5, 40.7, 58.6, 25.0 and 32.6%, respectively. The measured pumping rate was 13.9 m³/h. The total solid of separated solids was 21% of wet weight, while the TVS was 79% of total solids. The advantages of solid separation are: 1) reduction in storage volume; 2) reduction in suspended solids; 3) the separated liquid is more easily pumped; and 4) there is less of a tendency for separated liquids to form a crust. The solid fractions were composted in windrow piles in a shed, with a concrete floor and a corrugated plastic sheets. An experiment was conducted to study the cultivation of grain corn, using animal waste compost (AWC) made from separated solids from a livestock

farm. Three agronomic treatments were tested, namely: A: Chemical fertilizer; B: Animal waste compost only; C: Animal waste compost supplemented with chemical fertilizer. No significant differences were detected in terms of dry grain yield between Treatment A and Treatment C. Dry grain yield of Treatment B was significantly lower than the other two treatments. Shelling percentage remained unchanged whatever the treatment. Nutrient uptake by the corn plants just prior to tasselling showed a significantly lower uptake of N and K when only AWC was applied. No differences in uptake of N, P, K, Ca and Mg were detected at harvest. The use of AWC could reduce by half the use of chemical fertilizer, while maintaining similar yields.

News source: **MARDI, Malaysia**

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Miniature rice mill

RICE MILLING at the household and village level is important for small-scale farmers, and for consumers in remote areas. Engineer Eulito U. Bautista of the Philippine Rice Research Institute, Nueva Ecija, Philippines, has developed a miniature rice mill which is suitable for such areas. The rice mill is portable and cheap, and its performance can be compared to that of other rice mills. Its milling recovery is 70% head rice. It can also be used to mill other grains, such as corn, mungbean and soybean.

The village-level mill has a capacity of 120-160 kg paddy/hr, and requires a 7 hp gasoline engine or a 6 hp diesel engine. The household-level mill can process 40-70 kg paddy/hr, and requires a 1-hp electric motor or a 3-hp gasoline engine. Both types of mill are made of plastic and steel, and need only one person to operate them.

The paddy is dehusked between the milling rotor and the stationary hulling knives at the opposite

sides of the milling cylinder, and is polished by the pressure and friction among the paddy grains as they move backwards and forwards inside the milling chamber. Rice bran goes out through the concave end, while milled rice and rice hull are discharged from the chamber at the discharge end. Hulls and impurities are sucked by a fan through an air duct and are deflected below the discharge end. A wire mesh screen separates out impurities before the milled rice is discharged from the machine.

News source: **The Philippine Council for Agriculture, Forestry and Natural Resources Research and Development**

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Optimal plant crude-protein ration in the feed for kabir broiler

TO FIND OUT the optimal percentage of crude protein from plants in the feed, 450 one-day-old broiler chicks were given three kinds of feed with a different percentage of protein.

Experiment I (21.0%, 19.0%, 17.0%), Experiment II (22.5%, 20.5%, 18.5%), Experiment III (24.0%, 22.0%, 20.0%). Soybean was used as the plant crude protein. The three experiments gave the following results.

1. The percentage of crude protein in the feed did not affect the viability of chicks, at least within the ranges of protein percentage examined.
2. The optimal percentage of protein became lower as the chicks grew older. At the age of 0-3 weeks,

the optimal percentage was 21%. At 4-7 weeks it was 19%, and 7-10 weeks, it was 17%.

3. The average rate of protein needed for 1 kg of weight gain was 2.83 kg, 2.89 kg, and 2.89 kg in Experiments I, II, and III respectively.
4. It was concluded that Kabir broiler chickens need a low level of plant crude protein for feed, and that the lean rate is rather high, ranging from 75.4 to 77.9.

News source: Department of Agriculture and Forestry Extension, MARD

Non-destructive Quality Evaluation of Fruits Using NIR Spectroscopy

THE INTERNAL quality of fruits can be measured in real time and nondestructively by using visible and NIR (Near-Infrared) spectra. To estimate the soluble solid content of apples, MLR (Multiple Linear Regression), PLSR (Partial Least Square Regression), and ANN (Artificial Neural Network) models were developed. The three were compared, based on the coefficient of determination, bias and standard errors of prediction (SEP). A non-destructive automatic apple sweetness grading system, which consists of photodiode-array (PDA) sensors, quartz-halogen lamps, and fiber optic to transmit the light, was developed and evaluated. The MLR model, which uses wavelengths

of between 800nm and 1100nm, was adopted as the best system to estimate the soluble solid content of apples. The results of the performance tests of the system showed a SEP of 0.798 Brix, a bias of 0.264 Brix, and a handling capacity of 3 apples per second.

News sources: **National Agricultural Mechanization Research Institute (NAMRI), Rural Development Administration, Suwon441-707, KOREA**

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