

GIGO - A NEW MEANING

M.A. Santos - Mendigo

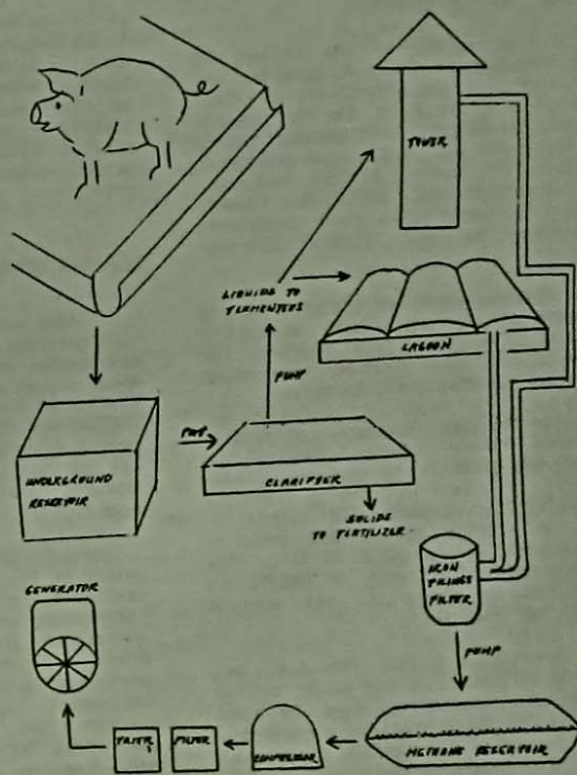
Biotechnology is slowly taking over the countryside. In some farms, animal waste is recycled to produce the combustible gas, methane, which is fed to a generator for electricity.

Time was when GIGO meant "garbage in, garbage out." In many places, it still does. But in Domino Farms in Biñan, Laguna, GIGO means "garbage in, gas out." That gas is methane. In January 1987, it saved the management ₱ 30,000 in electric bills.

The garbage is sludge from 14,000 pigs. Concrete pigpen floors slope towards canals which collect the water run-off carrying the feces. An underground reservoir gets the sludge and pumps the liquid out to a "clarifier" where suspended particles are allowed to settle. The solids are processed into biodynamic fertilizer.

The liquid is pumped into either of two types of fermentation systems. The Australian system consists of a gas-tight tower with a pipe leading to a centralized gas-processing system. The Taiwanese system uses the lagoon that all pig farms have. (Note. The government requires all pig farms to have a settling pond for sludge for pollution control.) Several rectangular balloons of burnt-orange rubberlike material lie side-by-side over the lagoon. The bottom has holes through which gas can enter. Domino Farms has about a dozen balloons, enough to cover the entire lagoon. Pipes lead from the balloons and the tower to a gas-filtering cylinder containing iron filings. The iron filings eliminate hydrogen sulfide, a by-product of fermentation.

From the filter, the gas is pumped to the methane reservoir which is also a rectangular balloon the size of a small swimming pool. Since there may be gas leaks in the methane reservoir, smoking is strictly forbidden in the area. The reservoir is inspected daily for gas leaks.

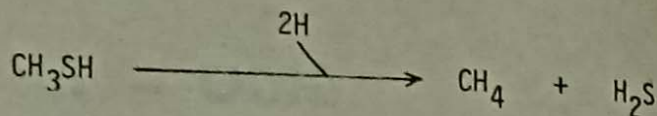


The author is in the Department of Biochemistry and Molecular Biology, College of Medicine, University of the Philippines, Manila.

The gas is compressed to 10 psi and passes through a couple more filters before being fed to the 75 KVA (kilovolt ampere) Caterpillar generator. The generator runs for 12 hours and operates the water pumps, blowers, and infrared lamps used for controlling the temperature in pens with newborn pigs.

What is the biochemical basis of methane gas formation? Intestinal microorganisms may comprise as much as 25% of the dry weight of feces. By fermentation and putrefaction, the bacteria produce various gases like CO₂, ammonia, methane, hydrogen, nitrogen, and hydrogen sulfide. Hydrogen sulfide results from a series of reactions converting the sulfur-containing amino acid cysteine to mercaptans and finally to

methane and hydrogen sulfide (1).



With biogas production proceeding so well, the management of Domino Farms looks forward to the day when biogas will enable them to exist independently of the local electric company.

REFERENCES AND NOTES:

1. Martin DW, Mayes PA, Rodwell VW, Granner DK. Harper's Review of Biochemistry (20th Ed.). Los Altos: Lange Medical Publications, 1985.
2. The author thanks the management of Domino Farms, Mr. and Mrs. Jacinto Galang, for their hospitality during the tour of the farm.

RESEARCH NEWS

YAKULT AGAINST DIARRHOEA

A University of the Philippines microbiologist, Dr. A.V. Jacalne, has investigated the effectivity of Yakult as a biological agent for the prevention and control of diarrhoea due to enterogenic *E. coli*, diarrhoeagenic Vibrios (*V. cholerae* El Tor), and classical *V. cholerae*. Yakult is a commercially prepared milk drink containing *Lactobacillus casei* LC-9018 Shirota strain.

The objective of the study was to determine the approximate amount and shortest length of time required for Yakult to give maximum protection against diarrhoeagenic bacteria.

Lyophilized toxigenic strains of *E. coli*, *Vibrio cholerae* (Ogawa El Tor JR-3) and classical *V. cholerae* (Inaba 569-B) were used in inducing diarrhoea in rats. The organisms were reconstituted in sterile broth, and grown in Syncase medium for 18 h at 37°C. The anti-diarrhoeal activity of Yakult was evaluated by using the rat ligated intestinal loop test.

The results showed that a minimum of 40 mL of Yakult a day given orally for seven consecutive days to rats weighing 200-250 g provided a protective rate of 97.22% against diarrhoea caused by enterotoxigenic *E. coli*,

94.44% against *V. cholerae* El Tor, and 91.55% against classical *V. cholerae* 569-B. It took three to five days to build up moderate protection, and six to seven days for maximum protection against all three organisms. Further studies will be done to determine the actual mechanism by which diarrhoea is prevented.

NEW HOPE FOR LABORATORY INSTRUMENT USERS

There are now long-term and short-term programs for upgrading the use and maintenance of laboratory instruments. About a year ago, the Philippine Association of Laboratory Instrument Users (PALIU) was formed as a non-stock, non-profit organization composed of chemical and medical laboratories in the academe, hospital, government and private sectors.

PALIU, through the active participation of its members, aims to: i) make available a directory of member institutions and individuals, for easy communication among and between them on areas of common concern; ii) make available a directory of laboratory instrument suppliers and respective product lines, for easy reference whenever need arises; iii) establish an accreditation system for laboratory instrument suppliers that will serve as

a guide for members in selecting instruments; iv) organize seminars, workshops, conferences and training courses on different aspects of instrumentation; v) put out publications on important areas of laboratory instrument use and maintenance; and vi) maintain a newsletter.

According to PALIU president, Mr. Manuel Yatco, the Association is exploring the possibility of tax rebates for members on the instruments they purchase.

On June 5, 1987, PALIU sponsored a seminar workshop on UV-Vis spectroscopy. In November 1987, there will be a seminar on chromatography (thin layer, gas, and high performance liquid chromatography, among others).

The Association counts 40 members coming from various institutions and 12 individual members. Annual fees for institution and individual members are P 500.00 and P 50.00 respectively.

Anybody who wants more information about PALIU can contact its secretary, Dr. Aida Aguinaldo.

*Address: Food Nutrition Research Institute (FNRI)
Taft Avenue, Metro Manila
Tel. No. 50-30-41 Loc. 9

Reported by: Patricia B. Generoso
Department of Chemistry
St. Scholastica's College