

## The fermentation method can easily be adopted and adapted by farmers

make only a small profit by feeding with non-chicken-manure treated vines. The chicken manure treatment would provide farmers with a substantial profit, as well as the highest weight gain.

### CONCLUSIONS

Fermentation is a simple process that requires little investment or equipment. Chicken manure is readily available and cheap especially since only small quantities are required. The only equipment needed is a set of scales for weigh-

ing the ingredients, and bags for storing the ferment. The chicken manure treatment would provide farmers with a substantial profit, as well as the highest weight gain

The fermentation method can easily be adopted, or even adapted, by farmers. During the meeting held soon after the trial, forty women showed great inter-

est and enthusiastically copied the suggested method. Along with the profitability, these women considered the labour-saving and storage potential very significant. These results may be disseminated and experimented with widely among pig farmers in north and central Vietnam where sweet-potato vines are an important component of the pig feed. The Department of Agricultural and Rural Development of the district and organisations at community level should be encouraged to disseminate the information and demonstrate the processing and feeding method to farmers. Instead of encouraging the use of commercial protein supplement, which is mainly imported, favourable conditions should be created for farmers to experiment and use locally available materials to increase the necessary protein for pig feed.

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# Linking students to urban livestock producers in Mexico City

**A model for integrated higher education for training veterinary medical-animal husbandry students is discussed. In this model, students analyse local seasonal foodstuffs and immunisation and parasitism, while learning about marginal livestock producer needs. Both the University and the livestock producing families benefit. The former because it uses local resources, and the latter because they increase their knowledge, and use of foodstuffs, and reduce parasitism and, presumably, public health problems too.**

Since 1974 the Autonomous Metropolitan University, Xochimilco Campus (UAM-X), has offered a four-year veterinary medical-animal husbandry degree programme, in which students relate practice to theory. The modular-integrated educational system, or programme-

based-learning research assists teachers to determine areas of knowledge that should be taught and services that professionals will need to offer in the future. Students are made aware of problems and needs of Mexican producers, especially marginal livestock producers. Each academic quarter terminates with student-team presentations in which producers participate. Since the start, other knowledge areas have been incorporated i.e. protection against disease, parasitism and clinical cases on the veterinary medi-

cal-biological side and history, culture and family on the social side.

Mexico City's southern edge is an extensive semi-rural/semi-urban agricultural zone, having a large number of backyard-rooftop family livestock units. Such peri-urban livestock may include varying populations of animals ranging from two to nine animal species per household. Interestingly and despite livestock activity in the marginal sector, neither local, nor national censuses have shown interest in urban livestock producers. This lack of interest is unfortunate as family urban livestock production means self-reliance and support to the general economy. Producers do not beg, do not wait for handouts or subsidies, and hunger is not a menace. Experiences of the training programme

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Photos by E. Arias

have offered opportunities to direct students towards local foodstuffs and also towards theoretical and practical nutritional and anatomical differences in the animals kept in urban areas. Findings showed up to nine animal species per household for self provisioning, sale and special events, which form excellent niches for a variety of forms of training.

Table 1 shows species and purposes for keeping them. The dog, for instance, originally eliminated from the programme because it was not considered a food-producing animal, resulted as an exceptional species because of: i) high family esteem; ii) its role as transmitter of disease. Urban livestock production in the backyard and on rooftops has been character-

ised as inefficient, making little use of modern technology and having little interest in profit. Factors like space, time, protection, family economy, whether the animals are to be consumed or sold, are considered before animals are purchased. Vaccination is rare, only carried out if government deems it necessary to vaccinate all animals within a certain area and against a specific disease. Worming is carried out occasionally and veterinary services are sought only as a last resort. Backyard animals are fed with locally grown feeds, tortillas and other leftovers found to be the most common. Interest lies more in energy than in nutritive value.

The producing family consists of up to three generations, each member having specific farm chores depending on age, gender, and off-farm activities. Plots vary in size from 50 to 200 m<sup>2</sup> with additional land rented as needed. Where the man of the family is absent, the wife handles both family and farm activities. Livestock production is a family activity keeping family members busy and united until

children get married, and start to earn an income and/or leave the homestead. Formal schooling among adults does not presently exceed primary level, although younger generations are now given opportunities to advance to higher educational levels.

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Mexican marginal urban livestock producer needs in Mexico City's southern edge, while being trained in the use of available feedstuffs and future problems the professionals will have to face. Urban livestock families benefited from a continuous university connection and, some, if not all, their questions are responded to.

The educational integrated system is complicated, but worth all efforts, needing nevertheless a balance between teacher and student autonomy, and creativity balanced with a degree of consensus and supervision.

Photographs have been taken by the author of this article and have been exhibited in eleven photo expositions in public and private institutions, as well as in the communities where the students were being trained. To the author the photographs represent an extension of what he has observed, a pedagogical tool so-to-speak to make his students and audiences a little more conscious of a neglected Mexican sector located in the periphery of one the most populous cities in the world.

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**Table 1. Findings concerning principle purposes of backyard animal species in Milpa Alta, Tláhuac and Xochimilco, Mexico City's Federal District (1995-2000).**

Animal species	Principle purposes
Beef	For sale and/or special family events
Cats	To maintain mice and rat population low
Chickens	The principle food item on the table
Dairy	Sale of milk to supplement daily income and/or family diet
Dogs	Protectors of family members, livestock and the homestead
Donkeys	Transport
Horses	Transport, work, rent-out and sale
Pigs	Fattened for special family events, reproductive stock, sale
Rabbits	Food for the family, reproductive stock and/or sale
Sheep	Fatten for special family events and/or sale
Turkeys	Raised for special holidays and for sale