

## **Evaluation of the nutritive value of ensiled and fresh Golden Apple snails (*Pomacea spp*) for growing pigs**

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### **1. Introduction**

Village pig and poultry production is usually referred to as the traditional, backyard or smallholder system. Sources of feed are mainly crop by-products, such as rice bran, broken rice or banana stem. Monogastric animals serve as family savings for short-term needs, such as school fees, books or clothing for children. Animal products provide part of the dietary protein for the rural families (Chantalakhana *et al.* 2002).

In Laos, the majority of pig producers are smallholders, most of whom are located in the rural areas. Depending on the area and scale of production, pigs are important to them as a major source of family income, as a sideline for raising funds for particular purposes, as a savings bank, as a source of protein for the family, and for cultural reasons.

<http://www.aciar.gov.au/web.nsp/doc/aciar.5 ND732>.

Golden Apple Snails (GAS) (*Pomacea spp*) were first introduced from Thailand into Sikhotabong District of Vientiane Municipality in 1991 and spread to three villages, namely Viengsavanh, Nahai and Phosi. The first damage to lowland rice fields was reported in 1992. A few years later (1994), they were brought from Vietnam to the Northern Provinces of the country, mainly as a source of food.

Since then GAS have spread to 10 of 17 provinces of the country, mainly by way of connecting waterways, such as irrigation canals and rivers, as well as by people. GAS does most damage to young rice seedlings (seedbeds up to 20 days after transplanting), and consequently fields infested with GAS have to be replanted several times in order to replace the missing seedlings.

Presently, GAS is considered a major pest in the rice ecosystems of Laos. However, in Laos damage by GAS is prevented by collecting them in the fields, which has become inefficient in several areas, and due to labor constraints farmers turn to unspecific chemicals for help (e.g. Niclosamide or Baylucide, and Copper sulfate). These chemical products however pollute water and are a serious threat to other aquatic organisms as well as to the health of the people working in the paddy fields. Moreover, the Lao Government has developed several different control techniques focused on integrated apple snail management (e.g. preventing the entrance of the snails to the rice fields, hand picking, transplanting old seedlings, reduction of water levels in the rice fields and using a variety of local experiences (Douangbupha *et al.*, 1998).

Utilization of GAS by rice farmers in Laos is mainly for food (85%), animal feed (14%) and liquid bio-fertilizer or compost (only 1%).

*Pomacea canaliculata* includes 62.0 % (DM basis) crude protein in the flesh of the snail (excluding shell), and 14.9 % dry matter (UAF laboratory, 2004) and it also has high contents of minerals and vitamins (Rice Technology Bulletin, 2001). That GAS is a good source of minerals is indicated by the contents of calcium (35% in the shell) and phosphorus (1.2%) and it is also a good source of energy (13.94 MJ kg<sup>-1</sup>). Uncooked fresh GAS meal in pig diets can be used at levels of up to 15% (Catalma *et al.*, 1991).

By-products of the sugar cane industry in the form of molasses have been used widely as a cereal substitute in livestock feeds (Preston, 1995). This product has been shown to be promising for fattening pigs (Bui Hong Van and Le Thi Men, 1994) and has been used to make silage from high protein by-products such as shrimp waste (Ngoan *et al.*, 2000a).

## **2. Objectives**

- To determine the optimum proportion of a mixture of molasses and rice bran to GAS for ensiling the snails.
- To compare ensiled and non-ensiled golden apple snail in terms of digestibility and growth performance of pigs.