Small-scale duck farmers are constrained by poor access to appropriate technologies and information, as well as to market and support services, which could otherwise substantially improve their productivity and income.
Improved duck production of small-scale farmers in Asia

SMALL-SCALE DUCK PRODUCTION SUBSTANTIALLY CONTRIBUTES to household food security, helps diversify incomes, and serves as a renewable asset in many rural households in developing Asian countries. However, small-scale duck producers are constrained by poor access to appropriate technologies and information, as well as market and support services, which could otherwise translate into improved productivity, increased income, and sustainable duck production systems.

Ducks easily adapt to various adverse environments, and are well resistant to a variety of animal diseases. They can grow well with locally available feeds and less manpower is needed to raise them even under meagerly equipped facility, so that even women and aged people are able to easily manage the production. However, small-scale producers are constrained by poor access to appropriate technologies and information, as well as markets and support services, which could otherwise substantially improve productivity and income generation.

Recognizing the important contribution that duck production can make to poverty alleviation and rural development, FFTC in cooperation with the National Institute of Animal Husbandry (NIAH), Vietnam, organized the international seminar on Improved Duck Production for Small-Scale Farmers primarily with the goal of bringing together duck experts from all over Asia in order to share and exchange practical and technical information in support of small-scale duck producers, as well as to enhance technical cooperation in this area among countries in the region.

During the seminar held in Hanoi, Vietnam on 17-21 September 2007, technology and information to promote efficient production of ducks for Asian small-scale farmers, particularly in the areas of genetic improvement and improved cultural practices, were presented. The seminar also provided a better understanding of the usefulness of biotechnology in increasing egg production and fertility, and in improving viable embryos development and hatchability. The participants all agreed that if small-scale duck production is to remain sustainable, the use of better breeds and management of stock health and local feed resources, as well as the introduction of appropriate new technologies, must be enhanced.

Status and potential of duck production in Asia

In Asia, duck production has remained a traditional poultry industry, playing an important role in the rural economy. However, while in many developing countries ducks are traditionally raised in small-scale for meat and eggs, large-scale production has recently been prevalent among more advanced countries in the region, and chilled/frozen duck meat and processed eggs have become major export commodities. Faced with strong competition worldwide, duck industries in developed countries in the region have expanded to duck egg and meat processing as a major industry component aimed at achieving premium-quality duck products. Certification and traceability system have also been introduced for duck egg and meat products to guarantee food safety. And with the expansion of duck production and duck processed products, intensive duck farm management monitoring, sanitation, surveillance, biosecurity and emergency response systems have been established covering the whole range of duck farming. Along with this expansion are changes in choice of breeds, intensive cultural practices and improved housing systems, which usually involve large investment.

On the other hand, in many developing Asian countries ducks are still raised in traditional system of herding and scavenging, where ducks are mostly kept in small flocks by farmers as extra activities in between their crop farming routines, and are expected to produce eggs only as additional income to the farmers’ households. Variability of production is still very high because of low performance and productivity under extensive and subsistence system.
Under small-scale conditions, the main challenge is how to encourage farmers to shift toward a more intensive and efficient production system, and to help them overcome problems facing the duck industry such as low-quality breeding stocks, scarce and unpredictable quality of locally available feedstuffs, source of quality day-old ducklings (DODs), lack of information on the nutrient requirement of ducks, high cost of commercial feeds, and limited space of herding.

Technologies are then required for improving productivity and efficiency in intensive and commercial duck farming, especially in supplying good quality breeding stock with efficient feed utilization, and improved cultural practices. Duck farming has a great potential as a commercial entity for small-scale farmers, with the right program and policy support from the government and private enterprises.

Genetic improvement
In Asia, some major initiatives on genetic improvement have been done in Vietnam and Taiwan. In Vietnam, the genetic improvement of the local laying Co duck breed for farming systems and sustainable agricultural ecology was carried out in order to save on cost from importing egg-type ducks. The breeding effort was also intended to improve egg production for increased income of small-scale farmers, and to reduce environmental pollution and promote safe agricultural products from sustainable agricultural farming systems such as duck-rice, duck-fish or duck-fish-rice without chemical insecticides.

In Taiwan, the Brown Tsaiya, a Taiwan native duck, is one of the highest laying duck breeds in the world. Since 1984, a selection is being done in order to obtain a maximum gain for the number of egg laid up to 52 weeks of age, to increase eggshell strength at 30 or 40 weeks of age, and to keep constant egg weight at 40 weeks of age (BW40). Future initiatives will focus on identification of QTL and

Duck-fish integration system in Hanoi, Vietnam.
genes which control the economic traits by using DNA marker in order to enhance the efficiency of the selection for quantitative traits.

Also in Taiwan, Muscovy have been used as terminal sires in a 3-way crossbreeding by artificial insemination of the common duck female as well as in pure breeding for Muscovy for meat. Line 302 of Muscovy was moderately selected for body weight at 10 weeks of age. Growing traits, which included body weight at 10 and 18 weeks of age and length of the 8th primary feather at 10 weeks of age, were individually measured and recorded. The female ducks' laying performance traits was also individually measured.

**Technology and production systems development**

Technology and production systems improvement presented during the seminar includes the development of artificial insemination to improve production of mule ducks; establishment of nutrient requirements on ducks to facilitate the usage of completely formulated pelleted diet and to enlarge the scale of duck production; development of electric incubator to achieve a stable supply of healthy ducklings; research and development on duck meat and egg products to provide consumers with a variety of duck products and which is important in terms of sustainability of the duck industry; and further selection of economic traits of important breeds, germplasm preservation, biotechnology, processing of duck products, and alleviation of heat stress. Assistance and extension to the duck industry is always emphasized.

Production systems have likewise been improved considerably through technologies and practices such as improving the farm's general layout, sanitation, biosecurity, husbandry and health practices; management practices and key performance index of duck breeders in closed and open houses; changes in choice of breeds, trends in housing system, and simple and natural management practices of duck farms; development and management of layer duck farming and marketing of duck eggs; and production performances of breeders.
Future prospects and recommendations

There are different scales and levels of duck production systems in the Asian region. In some developing economies, duck farms remain under traditional system with low productivity and practically no breeding farm. However, interest toward intensification is increasing in recent years due to changing technical, social and economic environments. Modern technologies are required to support more intensive farming system in order to be attractive to farmers. Development of commercial strains, feeding strategy, and institutional innovations must be intensified, and regulations and standards must be implemented toward the sustainability and competitiveness of small-scale duck production.

In developing economies where small-scale production is prevalent, research and development and market and support services are critical to boost the economic importance of duck. Problems on quality breeders, high cost of feed inputs, threat of avian flu, and shrinking agricultural lands are the most immediate concerns needing attention from the government and the private sectors. Some development strategies to improve small-scale duck production include organizing farmers into cooperatives to facilitate efficient management and achieve economies of scale, technology diffusion, supply management, and improved production and market.

The general trend will be towards organized and larger units and consolidation, especially in the area of duck meat and egg processing. Some issues and concerns toward this trend include intensive duck farm management monitoring, sanitation, surveillance, biosecurity and emergency response systems, and food safety and traceability, which should be addressed to cover the whole range of duck farming. Along with this expansion are changes in production systems such as choice of breeds, intensive cultural practices, and housing systems.

In view of the concern of some developing countries for research funding, particularly for molecular research, technical cooperation within the Asian region must be promoted. More advanced countries like Taiwan can offer opportunities for research implementation and research results sharing. There should also be a follow-up meeting of the seminar to set up a network for technical cooperation among countries in Asia, so that a regional cooperation mechanism can be established to harmonize efforts in the promotion of improved duck production for small-scale farmers.
International Seminar on Improved Duck Production of Small-scale Farmers in ASPAC

Held at the NIAH, Hanoi, Vietnam, September 17-21, 2007
No. of participating countries: (8) Indonesia, Japan, Korea, Malaysia, Philippines, Taiwan ROC, Thailand and Vietnam
No. of papers presented: 12
No. of participants: 12 speakers and 20 local participants
Co-sponsor: National Institute of Animal Husbandry (NIAH), Vietnam

List of papers
Keynote paper
1. Genetic and selection of ducks in France
   - Christel Lise Marie-Etancelin, Station d'Amelioration Genetique des Animaux, Centre de Researches de Toulouse, INRA, France

Resource papers
2. Duck production and research in Taiwan
   - Jeng-Fang Huang, Livestock Research Institute, Ilan Branch, Taiwan ROC
3. Genetic improvement of local laying Co duck breed for farming system and sustainable agricultural ecology in Vietnam
   - Thi Minh Nguyen, Duck Breeding and Research Center, Vietnam
4. Duck production in Thailand: before and after avian influenza outbreak
   - Morathop Siripun, Department of Livestock Development, Thailand

Country papers
5. Technology development and current production system of duck in Indonesia
   - Hardi Prasetyo, Research Institute for Animal Production, Indonesia
6. Duck industry in Peninsular Malaysia - past and present
   - Cha Tak Yimp, Malaysia
7. Selection and application of laying Brown Tsaiya ducks in Taiwan
   - Yu-Shin Cheng, Livestock Research Institute, Taiwan ROC
8. Increasing the productivity of egg type Mallard Ducks raised by small-hold farmers in the Philippines
   - Edwin Villar, Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD), Philippines
9. Improved duck production of small-scale farmers in ASPAC
   - Narin Thongwittaya, Maejo University, Thailand
10. Selection studies for Muscovy duck in Taiwan
    - Hsiu-Chou Liu, Livestock Research Institute, Ilan Branch, Taiwan ROC
11. The situation of duck production in Vietnam
    - Duong Xuan Tuyen, Center for Livestock Research and Development, Vietnam
12. Current and prospects of duck farming in South Korea
    - Tae-Sung Kim, Nong-Hyup Economic Research Institute (NHERI), Korea

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