

OUTSTANDING ACHIEVEMENTS IN CHICKEN GENETICS AND BREEDING AT INSTITUTE OF AGRICULTURAL SCIENCES FOR SOUTHERN VIETNAM (IAS)

Chicken production has been considered as a traditional job of Vietnamese farmers and is a very important component to build up the integrated production systems of households. Economically, this enterprise always plays an essential role not only for family consumption but also for household income in rural and sub-urban areas. The backyard and semi-intensive systems are applied mainly for chicken production in these areas. Simultaneously, local and improved genetics are the first options of farmers for these production systems. In order to meet the needs of chicken production and help rural farmers improve their incomes, Binh Thang Animal Husbandry Research and Training Center (BTRC) under IAS had been one of pioneers in the field of crossbred chicken research since the early years of 1990s. Some achievements from this research program have been contributing to the development of chicken production section in Vietnam, especially in rural areas. A piece of evidence for this success is the state prize of science and technology awarded by the President of Vietnam for excellent achievements in chicken breeding research.

This paper will review several highlights obtained from the research of crossbred chickens and present some strategies on chicken genetics and breeding research at Institute of Agricultural Sciences of South Vietnam.

CHICKEN GENETICS AND BREEDING



Genetics for improved crossbred development

BT₁ improved chicken were developed by combining local breed known as Ri chicken and exotic genetics in 1992 at BTRC and then had been selected for the dual purpose of egg and meat through five generations. These chickens with deep brown color, yellow legs and yellow skin satisfy to the favorite of Vietnamese market at that time. At five month age, the body weight ranges between 2.2-2.5 kg and 1.5-1.7 kg for males and females, respectively and higher by 13.7-22.8% than that of local chickens. Egg production is between 180-210 eggs per hen per year and as twice as higher than that of local hens. Particularly, BT₁ chicken breed is suitable for the backyard and semi-intensive raising systems in rural areas due to high resistance to common diseases. During the period of 1994-1997, hundred thousands of BT₁ parent birds had been developed in more than 21 provinces, especially in Mekong Delta. Also since 1995, the improved chicken production has become a movement expanding through out the rural areas in Vietnam and brought the remarkable incomes to millions of Vietnamese farmers.

BT₂ improved chicken

Due to the increasing requirements of domestic poultry market, since 1998 the BT₂ chicken breed has been selected and developed from BT₁ by blending with some lines of Sasso chicken imported from France.

After the duration of six years for selection, trial and development in practical production, BT₂ chicken had been certified as a national chicken breed since 2004 by Ministry of Agriculture and Rural Development. BT₂ chickens are developed into two lines called "A" male line and "C" female

line, and much more improved for feather color and meat production in comparison with BT₁. They are brownish and medium in body size. The egg production of dam line is around 200 eggs per hen per year. Commercial chicken from these two lines (A and C) can reach to 2.0-2.2 kg in body weight at 12 weeks of age and their viability is about 95-96%. Comparing to some exotic improved breeds, such as Tam Hoang or Luong Phuong from China and Kabir from Israel, BT₂ improved chicken lines still present higher production by 10-15%. Similar to BT₁ breed, BT₂ chicken lines have high resistance to common diseases, good meat quality, good taste and suitable for both semi-intensive and intensive raising systems. Since 2001, BT₂ chickens have been developed through out the regions of North East of the South Vietnam and Mekong Delta with hundred thousands of day old chicks released into market per year. At present, the largest

Crossbreeding combinations in commercial production systems

Besides the commercial birds of BT₁ and BT₂ chicken lines, some other crossbreeding formulas between these lines and some exotic breeds have also been developed since 2003. Up to now, 16 commercial combinations of two or three ways between BT₂ lines (A and C) and Sasso (from France), Luong Phuong (from China) have been completed and applied for practical production in South Vietnam. Both of exotic chickens are colored feather breeds. Commercial crossing birds had played a prominent heterosis for growth, feed conversion and viability. At the age of 10 weeks, their body weights are around 2.1kg; feed conversion ratio is about 2.4 and viable rate is up to 98%. In particular, these crossing birds are very appropriate to the intensive and deeply intensive production systems, and bring to poultry producers a high profitability because

population of BT₂ chicken can be found in Long An and Tien Giang provinces and bring high profit to poultry producers in these areas.



Improved crossbred BT1

meat qualities and colors are better than that of exotic white chicken, so they are always sold at higher prices. In addition, due to combining ability of good characteristics from different genetic resources, some of crossbreeding combinations (Sasso males with BT₂ –C line females and Sasso males with Luong Phuong females, for instance) are favorable for the development of some new crossbred chicken lines in coming years.



Improved crossbred BT2

CONCLUSIONS: Crossbred chicken lines (BT₁, BT₂) and commercial crossbreeding combinations between BT₂ and exotic breeds (Sasso, Luong Phuong) have been outstanding achievements in the research on chicken genetics and breeding at Institute of Agricultural Sciences of South Vietnam in the past ten years. Their prominences are of production and quality for meat and egg in comparison to local breeds and some exotic ones (colored feather) from China and Israel. Especially, they have high resistance to common diseases and are appropriate to both of backyard and intensive raising systems. They have contributed remarkably to the growth of poultry production section in Vietnam and to the improvement of farmer's income.

In coming years, the research strategies will continue focusing on the improvement of meat production and quality of BT₂ chicken lines by genetic selection, on the development of new crossbred chicken lines from local and exotic genetics and the genetic improvement of several local breeds. These research orientations will contribute to satisfy the increasing demands of domestic markets and to the development of the sustainable chicken production systems with highly biological safety and economical effectiveness.



Farmer's backyard chicken development



Ac, a medicine chicken

STRATEGIES ON CHICKEN GENETICS AND BREEDING RESEARCH

Like other countries, the construction of sustainable production systems is the first requirement for animal production in general and for poultry production in particular in the face of bird flu outbreak in Vietnam. The development of poultry production in coming years has to satisfy to the requirements of biological safety and then to bring high profit to producers.

Therefore, the genetic quality and disease-free of breeding birds will be the target of poultry breeding programs. The selection and genetic improvement for BT₂ chicken lines will be the first priority in poultry breeding programs at BTRC. Because of the characteristics of domestic market and the habit and favorite of Vietnamese consumers, BT₂ chickens will still have a measurable proportion in domestic poultry markets in South Vietnam. However, they should be improved more for meat quality and yield. Therefore, advanced genetic techniques such as breeding value evaluation and genetic marker assistant selection will be applied for the breeding programs.

The selection and development of some new crossbred chicken lines from local and exotic genetics will continue to conduct in coming years. It is firstly to exploit the desirable characters of local genetics (high adaptability, meat quality, good taste and favorable colors) and the production potential of exotic genetics (high growth and meat yield). In the other hands, it is also to satisfy the increasing and diversifying demands of consumer habits. Thus, this is one of research strategies needs powerful investments from the Government to save much more foreign currency from the importation of chicken genetic resources.

Along with the development of crossbred chicken lines, the pure breed selection of local genetics will also be another research tendency of the poultry genetics and breeding at BTRC. Some local breeds like Tau Vang, Ac (medicine chicken) and Noi (fighting chicken) will be valuable genetic resources for this study. The aim is to diversify chicken breeds to supply to different groups of poultry producers of extensive and intensive production systems. Especially, it will supply high quality chickens for small holders to contribute to the improvement of their income and to the development of sustainable raising system in rural areas.