Poultry genetics and breeding in developing countries

Contribution of indigenous genotypes to production and consumption of poultry meat and eggs

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LOCATION AND DISTRIBUTION OF INDIGENOUS BIRDS
Despite the lower productivity of indigenous poultry genotypes compared with that of commercial strains, indigenous genotypes still comprise a large proportion of the overall poultry population in many developing countries, frequently in excess of 80 percent. In rural villages in most countries, the majority of families have small flocks of poultry, mainly chickens but sometimes other species including ducks, turkeys and guinea fowls, which provide family needs for poultry meat and eggs. These birds are invariably indigenous genotypes, or cross-breeds with a significant indigenous genotype component.

Because chickens account for more than 90 percent of the total poultry population in most countries, and because only limited information on other poultry species is available, the following discussion focuses on chickens.

In most countries, flocks of indigenous breed birds are not found in significant numbers in urban or peri-urban areas, owing to the lack of scavenging opportunities. In some countries, there are restrictions on small-scale scavenging flocks in urban and peri-urban areas, because of the risk of disease transmission (particularly HPAI) to the human population and to commercial poultry flocks.

THE RETENTION OF INDIGENOUS POULTRY BREEDS
Their low productivity raises the question as to why indigenous chicken genotypes in rural regions have not been replaced by commercial genotypes. There are several reasons for this:

- Most indigenous genotypes still go broody, and can thus hatch their own eggs without recourse to artificial incubation and hatching, which are necessary for nearly all commercial genotypes.
- Most indigenous breed hens have strong mothering instincts and rear their young up to an age when they can fend for themselves under a scavenging management system.
- Most indigenous chicken genotypes are light-bodied, alert and can run fast and fly. They are thus more able to escape from predators than commercial genotypes, particularly meat chickens.
- In most countries, the meat and eggs from indigenous genotypes are generally preferred to those from commercial broilers and layers, not only by rural but also often by urban dwellers, who will pay a premium for these products.
- Indigenous genotypes have been shown to be more heat-tolerant and resistant to bacterial and protozoan diseases and parasitic infestations than commercial broilers or layers.
- Commercial broilers and layers perform far less well under scavenging than under commercial confinement rearing and feeding conditions. This poor performance and the cost of chicks make it uneconomic to rear commercial broilers under scavenging conditions.
- Although most regions have significant numbers of sector 3 small-scale commercial confinement rearing and feeding operations with broilers or layers, the cost and risk associated with setting up and operating such enterprises are prohibitive for most poor rural families.

The performance of indigenous genotypes improves under commercial confinement rearing and feeding conditions, but generally not to an extent that makes production economically viable, mainly owing to the cost of compounded feed. However, if the premium paid for eggs and meat is sufficiently high, this form of management in medium-sized units can be justified. This is to some extent self-limiting, because if the market is flooded with indigenous meat and eggs, the premium paid for them will fall.

CONTRIBUTION TO DOMESTIC PRODUCTION AND CONSUMPTION OF CHICKEN MEAT AND EGGS
The poor productivity of indigenous birds means that their total contribution to poultry meat and egg production and consumption is considerably lower than their numerical contribution to the overall poultry population. However, because of their large numbers, their estimated contribution to meat consumption can be quite high in many countries (Pym, Guerne Bleich and Hoffmann, 2006).

Based on published reports of flock structures, productivity and egg management in several countries, a study to estimate indigenous chickens’ contribution to the overall consumption of chicken meat and eggs found that in countries where indigenous birds comprised about 80 percent of the total chicken population, adult indigenous breed hens accounted for about 20 percent of the total chicken population. The study assumed that broilers and layers each made up about 10 percent of the standing population, that layers were replaced annually, and that there were four batches of broilers per year.

The study then estimated indigenous chickens’ contribution to egg and meat consumption, based on:
- average egg production of between 40 and 60 eggs/hen/year from 3.5 clutches per bird;
- the preference in most communities for hatching the eggs to produce chicks, rather than eating the eggs;
• a generally high hatching rate of approximately 80 percent;
• a high chick mortality rate, with between 60 and 70 percent of chicks dying in the first seven weeks of life, meaning that an average of only one or two chickens are eaten per hatch of eggs.

The indigenous breeds’ contribution to egg consumption was found to be low, at about 10 percent, while that to meat consumption was much higher, at about 50 percent.

Although these estimates are imprecise, in the absence of other published figures they provide a reasonable basis for comparisons of the production and consumption of indigenous and commercial genotypes. As countries develop and their populations become more urbanized, the proportions of meat and egg consumption from commercial genotypes increase. In rural regions, however, there are strong arguments for retaining indigenous genotypes in small family scavenging flocks.

The productivity and profitability of small-scale family poultry production are critically linked to bird mortality rates, particularly among young chicks. These are normally very high owing to predation, disease, malnutrition and climate exposure. Mortality rates have been shown to reduce dramatically when chicks are reared in confinement with the hen, are creep-fed for the first couple of weeks after hatching, and are vaccinated against Newcastle disease (Alders and Pym, 2008). Adopting these procedures will minimize losses and ensure that indigenous poultry genotypes continue to be important in rural communities for many years to come.

REFERENCES