A combination of technology and genetics has transformed the poultry industry into a highly complex business over the past thirty years. Poultry, like chickens, are a source of both meat and eggs. However, unlike the chickens, they can be mass produced from eggs, intensively farmed in tiers in three-dimensional “batteries” and convert plant products into animal protein at a very efficient and economical 2:1 ratio. Poultry has become highly profitable in a variety of situations from backyard enterprises to large-scale poultry enterprises.

The Institute’s genetics program involves over 4,000 crosses each year. As a result, some Southeast Asian countries have produced more rice in the past 16 years than in the past 7,000 years.

Comparing the genetic and technological improvements in production of these commodities is quite difficult. However, while productivity in the poultry and pork industries has increased at a factor of 2 and the new Asian rice, with potential of improved yield by a factor of 10, has unreservedly been called “miracle rice”, how then do we describe tilapia, a commodity which, in a similar time period, has improved in potential productivity by a factor of not 2 or 10 but by a factor of 100?

Tilapia yields of 600-800 tonnes/ha/year are now attainable as a result of early genetic research coupled with intensive farming technology. However, water volume is more critical than surface area in such systems.

Yet, serious genetic work on tilapia is only just beginning, thirty years behind poultry and pigs, and twenty years behind Asian rice. Thirty years ago, world tilapia production through aquaculture was probably less than 20,000 tonnes. By 1981 it was probably about 200,000 tonnes, with four Asian countries alone (Taiwan, Thailand, the Philippines and Indonesia) accounting for 180,000 tonnes. Given the growing popularity of tilapia, it is now feasible to project that even using present research results, annual aquacultural production of these fish can attain 2,000,000 tonnes.

The potential for genetic improvement in tilapias is enhanced by their ease of hybridization. Oreochromis mossambicus, the Java tilapia, was the first tilapia species to gain an international reputation. Yields, appearance and growth rates were poor. O. niloticus was better, but showed faster growth crossed with O. mossambicus or with O. aureus, blue tilapia; the latter cross also gave all-male offspring. O. mossambicus crossed with albino O. mossambicus gave rise to a fast growing red variety, which came into commercial production in the late 1970s. Other hybrids and sex-reversed stocks of O. niloticus now give comparatively high yields.