

North-to-South Livestock Gene Flows Crowd out Local Breeds

In contrast to plant genetic resources, where genes have moved largely from South to North as industrialized countries search for disease-resistance and adaptive traits to be incorporated into new plant varieties, movements of livestock germplasm from South to North have been rare in the past century.

Until the beginning of the nineteenth century, when breeding organizations were first established in the North due to demand for higher producing animals, the movement of live animals caused a slow dispersal of genes largely from South to South and South to North. These flows, starting from the centres of livestock domestication (in western Asia and the eastern Mediterranean as well as Southeast Asia, the Indus Valley, North Africa and the Andes of South America), generally enhanced livestock genetic diversity.

Over the last four to five decades, gene flows via both live animals and their semen or embryos have accelerated both among countries of the North and from North to South, propelled by globalization and the commercialization of animal breeding. In the North, technological advances have made it possible to ship semen and embryos in addition to live animals (commercial use of semen started in the 1960s, of embryos in the 1980s, and of sexed embryos in the mid-1990s.)

The ease of movement encouraged large-scale replacement of many traditional local breeds with a few high-performance exotic breeds (called by some 'Formula One animals') and helped reduce livestock genetic diversity. Large White, Duroc and Landrace pigs, Saanen goats, and Rhode Island Red and Leghorn chickens have spread throughout the world, often crowding out local breeds. The black-and-white Holstein-Friesian dairy cow, for example, is now found in 128 countries and in all regions of the world and an astonishing 90% of all cattle in the North are of just six tightly defined breeds.

This breed replacement process has already run its course in North America and Europe, where half of all breeds documented are now extinct or in danger of becoming so. North America has the highest proportion of extinct breeds (25%) among its recorded breeds, a fact due not only to the domination of just a few breeds produced in highly specialized livestock industries but also perhaps to the region's high levels of breed recording.

The South now possesses an estimated 70% of the world's known livestock breeds, partly because in most countries commercial breeding has not yet taken hold, breeding stock is still traded without involvement of breeding organizations or companies, and many areas still lack artificial insemination coverage. In the face of the on-going Livestock Revolution, for example, it's probable that the transfer of pig and cattle breeding genotypes and systems will increase in rapidly developing countries of the South. In Viet Nam, for example, the percentage of indigenous sows declined from 72% of the total population in 1994 to only 26% just eight years later, in 2002. Of the country's 14 local pig breeds, five are vulnerable, two are in critical state and three are facing extinction. And in some countries, national chicken populations have changed practically overnight from genetically heterogeneous backyard fowl to selected homogeneous stocks raised under intensive conditions.

Generally, introduction of Formula One animals continues to be seen by developing countries as a solution to low productivity of local breeds even in areas where the exotic genotypes are ill-adapted and local breeds outperform crossbreds.

It is alarming that of the nearly 3,000 breeds newly reported to FAO between 1999 and 2006 and for which we have population data, 45% are either at risk or already extinct. It is clear that the South, currently rich in its livestock genetic diversity, will be the hotspot of breed losses in the twenty-first century. The crowding out of local breeds is set to accelerate in many developing countries unless special provisions are made for their conservation by providing livestock keepers with appropriate support.