



Tropentag, September 20-22, 2023, hybrid conference
“Competing pathways for equitable food systems transformation:
Trade-offs and synergies”

Development of novel Egyptian local broiler chicken lines: An Egyptian model for similar initiatives in low- and middle-income African countries under natural biodiversity and climate challenges

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Abstract

Climate change, globally and regionally in Africa, impacts the productivity and welfare of broiler (meat-type) chickens during the summer, especially when extreme heat waves occur in arid and subtropical regions. Adapted-local breeds may hold a plausible genetic solution for climate resilience. Therefore, Egyptian poultry breeders aimed at genetically improving the growth of climate-resilience-local chickens and developing new lines of broilers that are adapted to hot climate. At Cairo University, since 2003, we are practicing breeding schemes on naturally adapted local populations to generate local crossbred lines from the initial crosses between the two grandparents of commercial broiler female and male lines and two populations of adapted local chickens to local environmental conditions; White Baladi and Bandara. Afterward, the phenotypic selection was practiced for high growth at the marketing age of 6-week. Two crossbred lines were obtained, Cairo female line and Giza male line. The body weight of developed crossbreds was significantly around 2.4-fold heavier than those of the locals at week 6. In the Giza male line, we introduce naked-neck gene to enhance heat tolerance by crossing Naked-Neck breed with Giza chickens. Subsequently, Giza male chickens will be crossed with Cairo female chickens to produce a novel slow-growing Egyptian local broiler adapted to summer heat waves and inferior management conditions. Last year, we crossed them to produce the Cairo-Giza cross hybrid, for the first time in Egypt, named the Cairo-Mix broiler ($n = 300$). Although it is not as fast-growing as the international commercial strain, it performed much better than the local breed. Cairo-Mix reached 1.34 kg by 56 days of age compared to 600 g for the locals. The feed conversion ratio was 2.13. Cairo-Mix chicken has very low mortality (2%) and a good dressing percentage (65%). Despite its long growing period, it reached satisfactory economic efficiency. This improves animal welfare and contributes to maintaining the free-range or backyard poultry production systems and the competitiveness of the chicken industry in future business strategies under natural biodiversity and climate challenges.

Keywords: Animal welfare, food security, global warming, local Egyptian chicken