

Photo: Alessandra Silver

Helen Keller INTERNATIONAL

POULTRY:
A KEY COMPONENT OF NUTRITION-SENSITIVE AGRICULTURE

WHY ARE ANIMAL-SOURCE FOODS IMPORTANT FOR NUTRITION?

Animal-source foods, like meat and dairy, are energy-dense sources of protein, which is essential for growth and cell repair, and contain ample bioavailable vitamins and minerals (such as iron, zinc, vitamin B12, and riboflavin). Unlike plants, they do not contain phytic acid, a zinc- and iron-absorption inhibitor.[1] As they are nutrient-dense, animal-source foods are particularly good for young children, whose gastric capacity is limited. Animals also play a key role in household incomes. Selling animals and their by-products can be highly profitable, often offering income that is less seasonal than that from crops and can fill gaps during emergencies or the agricultural 'lean season.' [2,3]

Eggs are a particularly promising option for improving growth in young children.[4] They are easy to prepare and provide critical nutrients (including fatty acids, proteins, and vitamins A and B12) at levels above or comparable to other animal-source foods but are more affordable. Moreover, chickens mature quickly, laying eggs at 6 months, and produce regularly. They thrive in a range of environments with limited inputs and efficiently convert feed to high-quality food with a smaller environmental footprint than most other livestock. Finally, it can be more culturally feasible for women to own chickens than large, high-value livestock like cattle.[5] HKI has thus focused on poultry rearing as the most relevant, cost-effective, and impactful route for increasing animal-source food consumption in nutritionally needy areas of Africa.



HKI'S APPROACH TO POULTRY PRODUCTION

Our programs aim to encourage women's ownership of poultry and increase their production, consumption, and sale of meat and eggs. Poor management practices are often the main factor limiting chicken productivity, particularly through high mortality due to preventable diseases. Other key practices are using coops or nesting boxes, providing feed, and promptly collecting and storing eggs. We thus include strong training components, aiming to increase women's skills. We build on what exists and will still exist after a given project ends, linking participants to local suppliers such as village vaccinators. As improved breeds face problems with adaptation, we focus on local or hybrid breeds and aim to increase productivity through improved techniques. We approach poultry and gardening as an integrated, synergistic system: manure and eggshells can be ingredients in compost, plant waste can be fed to chickens, and scavenging chickens can consume pests.

Increasing poultry rearing will have little impact on nutrition, however, if people do not eat eggs and meat or feed them to children. Indeed, egg consumption among African children is very low, with young kids rarely being fed eggs. Many cultures believe that eggs are unclean or hard to digest, or have egg-related taboos—for example, claiming that if a young child eats eggs, he will become a thief as an adult, or that eating eggs while pregnant will make the baby grow hair, causing irritation to the mother. Strange though these taboos are, they constitute real barriers to consumption. Also, poor households often (understandably) see an egg consumed as a chicken that can't be raised and sold.

Behavior change communication is thus an essential component of HKI's approach, used to address not only taboos but also equity issues: access to eggs and meat by women and children can be limited by differences in food allocation within a household, as men or elders may have priority. Communication can also valorize chickens' economic benefits. The SPRING project in Senegal, for example, made a community-led video showcasing a local woman who used poultry production to improve her family's nutrition and her financial autonomy, freeing herself from dependence on her husband's income.

PREVENTING POTENTIALLY NEGATIVE SIDE EFFECTS OF POULTRY PRODUCTION

While poultry offer many benefits for low-resource households, there are also drawbacks. Chickens are often kept in close quarters with humans, scavenging in the courtyard, sometimes sleeping in the house, and leaving behind droppings, rich with e-coli bacteria. As young children often play in these areas, and are constantly putting dirty hands or objects in their mouths, they are at risk of infections. This can also lead to environmental enteric dysfunction, wherein changes in a child's gut make it difficult to absorb nutrients, with negative ramifications for growth. There is also a slight risk of humans catching chicken diseases. Avoiding these effects requires careful planning. Families rearing chickens can be encouraged to keep them away from humans, or at least to separate chickens from children using coops or child play mats. Elevated drying racks can help prevent chickens from contaminating cooking pots and utensils.



NEW EXPERIMENTS IN POULTRY REARING

The CHANGE (2013-2016) project, funded by Global Affairs Canada in Senegal, Burkina Faso, Cote d'Ivoire, and Tanzania, offered opportunities to experiment with expanding poultry rearing for nutrition and income in Africa. In CHANGE Burkina Faso and Tanzania, contribution and cost-sharing were key. In Burkina Faso, villages had to build henhouses before receiving poultry to be raised collectively. In Tanzania, chickens were distributed to project participants who did not already own them—but only if a coop had been built that met established quality standards. Irregular vaccination was identified as a reason for high mortality and low productivity, so HKI and partners trained local resource farmers to deliver vaccinations and provided them with information cards on the importance of vaccination.

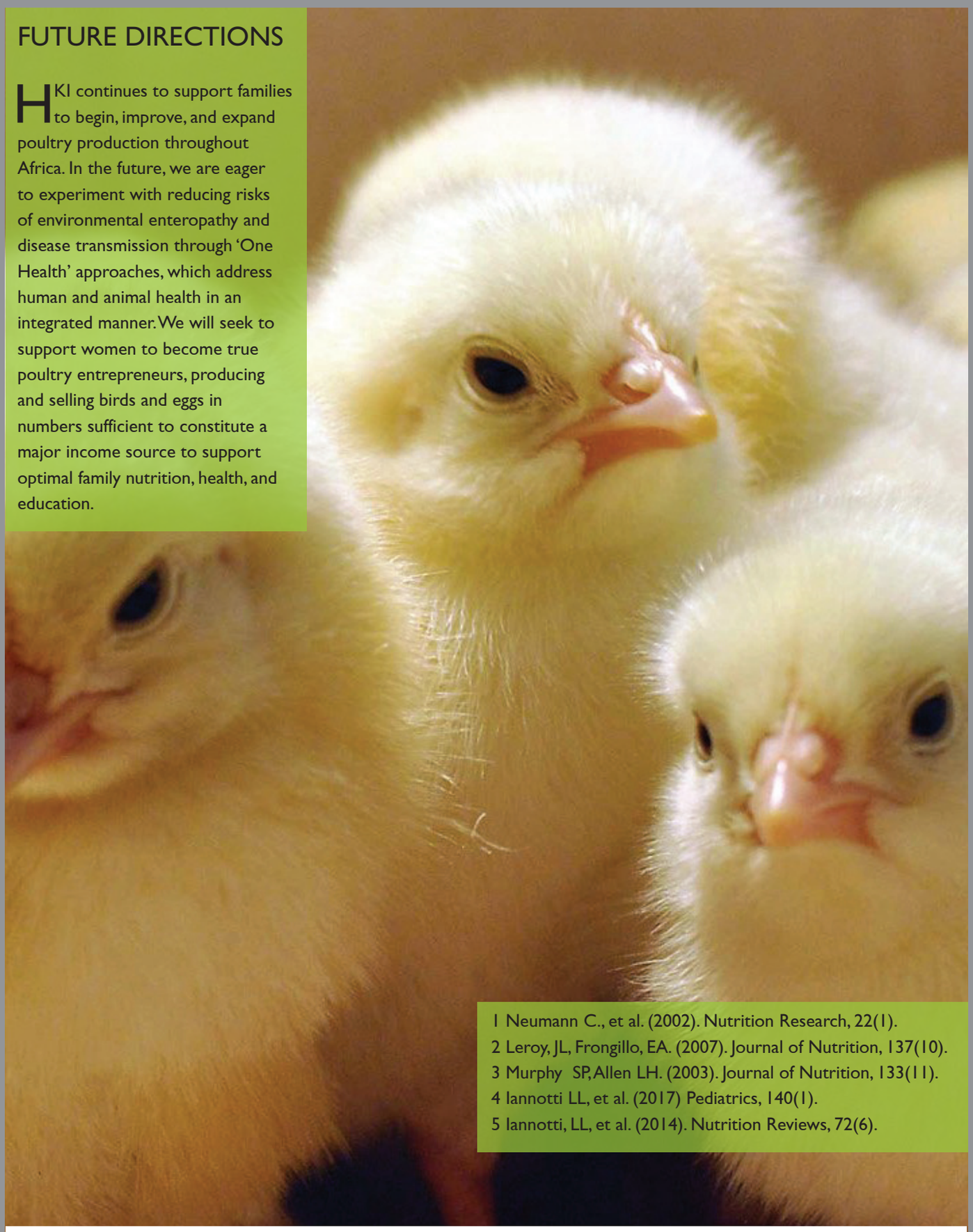
In Cote d'Ivoire, HKI partnered with the government to build 20 demonstration coops in villages, then tested three different strategies: laying hens for egg production, broilers for meat, and a hybrid local-improved race system for lower-yield, lower-input egg and meat production. Local women were trained to oversee these facilities, and all participants received training on best practices. Project staff then closely monitored the three systems in terms of mortality, input costs, production, and revenues. In Senegal, HKI adopted another innovative approach. Given the project's urban context, chicken-rearing needed to be feasible in small spaces. Thus, HKI and partners worked with local carpenters to build mobile chicken sheds that fit in a courtyard, entryway, or roof. Participants were then given personalized training in intensified poultry rearing, provided with improved-breed laying hens and a rooster, and asked to buy at least one chicken to add to the flock.

The results were encouraging: over the project life, chickens owned per participant increased from 3 to 6 in Burkina Faso, 9 to 18 in Côte d'Ivoire, near 0 to 9 in Senegal, and 2 to 8 in Tanzania. The number of eggs produced increased in all countries, reaching as high as 22 per fortnight in Senegal. These changes had real impacts on nutrition: egg consumption among young children increased by more than 10 percentage points in all countries. In some cases, poultry significantly contributed to income: in Cote d'Ivoire and Burkina Faso, 32-38% of participants sold chicken(s) in the past four months, earning an average of $10.00—a not-insignificant amount, given women's limited access to income. Moreover, a sustainability study of the approach in Senegal showed that over 75% of participants continued to raise chickens long after the project ended, some transforming their production into a lucrative enterprise.

The experimentation in Cote d'Ivoire also yielded useful results for future interventions. Mortality was much higher for laying hens and local-breed chickens, whereas broilers were by far the most lucrative: a village-level operation could earn over $1,000 in annual profit, more than twice that for laying hens. While laying hens provided considerably more eggs, they were slow to mature, more complex to raise, and less efficient at converting feed. Thus, while local chickens were a decent option for household egg production, a village-level for-profit system was better served by focusing on meat production using broilers.

FUTURE DIRECTIONS

HKI continues to support families to begin, improve, and expand poultry production throughout Africa. In the future, we are eager to experiment with reducing risks of environmental enteropathy and disease transmission through 'One Health' approaches, which address human and animal health in an integrated manner. We will seek to support women to become true poultry entrepreneurs, producing and selling birds and eggs in numbers sufficient to constitute a major income source to support optimal family nutrition, health, and education.



1 Neumann C., et al. (2002). Nutrition Research, 22(1).
2 Leroy, JL, Frongillo, EA. (2007). Journal of Nutrition, 137(10).
3 Murphy SP, Allen LH. (2003). Journal of Nutrition, 133(11).
4 Iannotti LL, et al. (2017) Pediatrics, 140(1).
5 Iannotti, LL, et al. (2014). Nutrition Reviews, 72(6).

Global Affairs Canada

The CHANGE program and the development of these briefs were supported by funding from Global Affairs Canada