



Implementing Poultry Vaccination and Biosecurity at the Village Level in Tanzania: A Social Strategy to Promote Health in Free-Range Poultry Populations

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Local chickens are an important resource benefiting the livelihoods of impoverished people in developing countries. Household chicken production provides food and income and is an important component of food security for the rural poor. However, rampant poultry diseases, predation, and poor production practices are among hindrances to improving village poultry productivity. The human community structure in African villages provides the social setting necessary for collective action to prevent diseases among free-ranging poultry. The Newcastle Disease and Avian Flu Control (NDAFC) project was aimed at testing the effectiveness of a multi-level community approach to implement a Newcastle disease vaccination and general poultry health and management program in three districts in Tanzania. The project successfully trained 197 local leaders, 86 village chicken vaccinators and 196 farmers in three wards of Tanzania. The vaccination of 158,343 chickens in selected villages of the three wards substantially controlled Newcastle disease. This field research has confirmed the importance of local social and technical considerations in developing intervention strategies, the value of engaging local leadership, and the benefit of designing holistic rather than singular-purpose animal health programs.

Background

Local chickens are an important resource benefiting the livelihoods of impoverished people in developing countries. Household chicken production provides food and income and is an important component of food security for the rural poor. Selling local chickens is one of the few income-generating activities accessible to women in poor households. Local chicken production is a low input system requiring minimal investments to maintain. Chickens can even be raised in households without land, as they can be sustained through scavenging for sustenance between houses and on communal village land (Gueye 2000, Permin et al. 2001).

Rampant poultry diseases, predation, and poor production practices are among hindrances to village poultry productivity. Viscerotropic velogenic Newcastle disease (referred to hereafter as ND) and parasites have been identified as the major health threats to local chickens. It appears that the ecology of village chickens exposes them to ideal conditions for these health problems (Yongolo, 1996). Chickens from multiple households often congregate during scavenging to form one large sub-village or village flock, creating infectious disease exposure and transmission dynamics that are unique among poultry production systems, and where intervention strategies are difficult to apply.

While the human community structure in African villages allows for the co-mingling of household flocks (which creates biosecurity challenges), it may also provide

the human social setting for collective action to prevent diseases and improve poultry production. In contrast to the social setting in North America, for example, where individual households are not prone to act collectively to improve animal production, village communities in Tanzania routinely act collectively (Msoffe personal communication, 2008). The community structure of the rural village setting in Tanzania is conducive to local collective action for implementing a community-based local poultry program, including a ND vaccination program.

The Newcastle Disease and Avian Flu Control (NDAFC) project was aimed at testing the effectiveness of a multi-level community approach to implement a Newcastle disease vaccination and general poultry health program in three districts in Tanzania. Authors hypothesized that successful intervention for disease control (animal or human) requires: 1) an approach that considers local social, economic, and biological settings; 2) community involvement; and 3) specific disease control efforts to be part of broader poultry health programs that address the priority diseases as measured by the community, as well as production and marketing problems faced by rural farmers.

Major Findings

Project outcomes were measured by: 1) assessing the number of people trained as a result of local leadership

engagement; 2) the numbers of birds vaccinated for ND; and 3) the change in status of ND in the villages after vaccination. A total of 197 leaders at district and ward levels were trained in the importance of village chickens, social and economic aspects of village poultry, an overview of avian influenza and other important poultry diseases, village poultry management, and their role in providing institutional support for the program. The trainees included all of the district veterinarians, agricultural extension staff, district councilors, ward education coordinators, ward/village executive officers, village chairpersons, and community development officers. The village and sub-village leaders selected vaccinator and recorder trainees. A total of 86 village chicken vaccinators were trained in three wards. In addition, 196 farmers were trained on similar topics as the local leaders, except that the training was presented as a drama, and project poultry experts answered farmers' questions. Three rounds of vaccination within a one-year period were conducted.

In total, 158,343 individual birds were vaccinated. The control of ND appeared to be effective. A survey conducted before the institution of the vaccination program found that an average of 53.1% household respondents in the three project wards reported an outbreak of ND in 2006. That number dropped to 15.7% in December 2007, after just one round of vaccination. During the data-recording period starting in December 2007, none of the farmers contacted reported outbreaks of ND in their flocks, indicating that the program was working.

Local Social and Technical Considerations Important for Effective Strategies. This project employed both social and technical strategies for implementing a program to improve poultry health. Limited household resources, the collective nature of the villages, the existing local governance structure and systems, and the ecological reality of free-ranging village chickens are the key features of the Tanzania rural setting that influenced project design.

Empowering Local Leaders Contributed to Success. Study results show that involving the local leadership in the planning and administration of the ND vaccination program was an effective approach--many people were trained and many chickens were vaccinated during the 18-month project period. But beyond these concrete measures of success, there were policies implemented which were prompted by preliminary indications of success before project outcomes were measured. Following the first two ND vaccinations, the Veterinary Investigation Centre for the Southern Highlands Zone organized district, ward, and non-governmental organization (NGO) leaders within the zone to utilize district and NGO resources to adopt an ND vaccination program throughout the area. The zonal program was launched with the declaration of May 5th 2008 as "Kuku Day" (chicken day) to initiate

vaccinating chickens in all villages in the zone, which includes the Iringa, Mbeya, Rukwa and Ruvuma regions, covering a total of 24 districts. The coverage and impact of Kuku Day and the zonal ND vaccination program have not yet been appraised, but this action demonstrates a sense of ownership over the project and is a promising indication of the sustainability of the multi-level community approach to poultry health improvement. After the first year of the project period, leaders at all levels agreed to include ND vaccination in their planning and budgeting activities.

Social Structure of Villages is Conducive to Collective Strategies. This project was designed to take advantage of the established collective action of the village community to train and engage the village leadership as well as household poultry producers. The multi-level dimension of the project fully engaged the village leadership prior to training local vaccinators and households, instead of taking the more common approach of simply working directly with households (Yongolo et al., 1998). Early engagement of the village and sub-village leaders allowed them to exercise their normal leadership roles to mobilize the collective action of village residents. The training of local vaccinators and data-recorders contributed to technical capacity building that will remain in the local community after the life of the project.

Local Implementers Proved Effective. The vaccination and data recording carried out by local trained personnel was vital in giving the program a local familiar face. Farmers were inclined to interact with the local vaccinators more readily than if vaccinations were carried out by outside project staff or district staff. Training of farmers as well as vaccinators increased efficiency of the vaccination program because both parties were familiar with the issues and procedures. However, during the project, farmers were trained last, causing initial difficulties for the vaccinators and recorders working with them. These difficulties included explaining why the farmers had to vaccinate only healthy birds; why birds may die even after vaccination, hence farmers holding the vaccine suspect; and why records must be updated every week, among other issues. Most of the difficulties encountered by the vaccinators and recorders were significantly reduced after the farmers received training.

Holistic Approaches Addressing Priority Local Health Issues Are Likely to be More Sustainable. Successful programs for human or animal health require an inclusive, holistic strategy. In the setting of local poultry health in Africa, narrow approaches focusing only on ND, or focusing on disease prevention rather than the full range of poultry health and management skills, have had limited success. Other ND vaccination projects have reported early success, but later reported the emergence of other causes of poultry mortality as birds live longer (Yongolo et al.

1998). If farmers do not understand that ND vaccines only protect against ND or are otherwise unprepared for poultry diseases besides ND, confidence in the program falters when other diseases appear. A singular approach to preventing HPAI would likely have even less success because there is no short-term benefit to controlling an existing devastating disease like ND. Controlling HPAI and ND as part of a more holistic program to prevent poultry diseases and improving poultry husbandry has more promise for long-term success (Permin et al. 2001).

Novel Training Methods Engage Local Experience and Ideas. The authors found that novel training methods, which avoided traditional lecture-style presentations, were well received by the communities. In particular, the dramatic presentations delivered to village households were well received by the audiences, and deemed an effective way to present the material with non-traditional means. Additionally, interaction was encouraged in all courses. During the trainings, most participants shared personal experiences highlighting the importance of chickens for them. Some local leaders were also poultry farmers, and they also participated in these trainings. Farmers indicated that lack of knowledge had been the primary hindrance limiting their ability to improve poultry productivity, and they pledged to use their newly gained knowledge to improve production. Anecdotally, many trainees told trainers that the most useful part of the training was the briefing on poultry diseases and ways to control them, especially the concept of community disease control.

Practical Implications

The village community approach to poultry health management is well-suited to the ecological and social features of rural Tanzania. Ecologically, free-ranging chickens in a sub-village or village are essentially one flock, because they co-mingle during the day when searching for food. The principles of disease biosecurity necessitate that all of the households whose poultry co-mingle take collective action to prevent diseases in the village flock. Therefore, coordinated community action is imperative to improve the health of all poultry in the village setting.

Farmer Trainings Create a Local Disease Surveillance Network. At the village level, farmers' training implemented by the NDAFC identified the need to give trained project recorders additional training in poultry disease surveillance so that they can respond to village poultry health problems and report them to the extension agents. This cadre of trained recorders made disease identification and reporting effective and efficient. Decentralizing this task to the sub-village level will increase the likelihood that incidences of poultry diseases with high mortality and possible public health implications will be identified and reported early. This is important in the village settings of Tanzania where poultry interact freely with humans, especially children.

A Multi-Level Approach is Likely to be More Effective and Sustainable. Results from the NDAFC project suggest that engaging and training local leaders and

The Iringa District Commissioner injects a drop of the Newcastle disease vaccine into the eye of a village chicken on "Kuku Day" (Chicken Day), May 5, 2008. Kuku Day, organized by the Veterinary Investigation Centre for the Southern Highlands Zone, integrated district, ward, and non-governmental organization (NGO) leaders to utilize district and NGO resources to adopt a Newcastle disease vaccination program throughout the area. The zonal program, which includes the Iringa, Mbeya, Rukwa and Ruvuma regions and covers a total of 24 districts, was launched on Kuku Day with the objective of vaccinating chickens in all villages in the zone. Photo by Danielle Knueppel.



farmers, instead of engaging only government staff or individual households, will yield more effective and sustainable results for animal health. This kind of multi-level community approach may be practical and effective in many developing countries with grassroots social organizations like the village setting in Tanzania. The project demonstrates that it is particularly important to involve local leadership during planning and to give them a lead role during implementation of the program. Involving local leaders helps avoid conflicts with other development programs, especially infrastructural development in the villages. These leaders can also be of great assistance when setting up schedules for various development activities.

Implementing Effective Community Animal Disease Control Programs. Animal disease control programs in developing countries can be very difficult to implement. In developing countries generally and in Africa specifically, poverty and consequent lack of resources to apply

interventions, are critical deficiencies. However, the existing community structure creates an environment for the implementation of community animal disease control programs that are simply not possible in many developed countries. Additionally, the close relationship of people to their sources of food and thus, their recognition of high priority problems like ND in poultry, gave project researchers the opportunity to capture community interest by solving a recognized problem. A poultry disease like ND, which affects community food security, ranks as a high priority in addressing community health.

Program Sustainability. Social and technical strategies are both very important to the success and sustainability of improving animal health in developing countries. The community structure in Africa utilized by the NCAFC project provides a basis upon which such strategies can succeed, especially when directed at a community asset like village poultry.

Further Reading

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The Newcastle Disease and Avian Flu Control Project (NDAFC project) is a research sub-project of the Avian Flu School (AFS) project and was created to assess effective social and technical strategies for conducting Newcastle disease vaccination and preventing poultry diseases at the village level. The project is led by Dr. Carol J. Cardona. Email: cjcardona@ucdavis.edu.



The Global Livestock CRSP is comprised of multidisciplinary, collaborative projects focused on human nutrition, economic growth, environment and policy related to animal agriculture and linked by a global theme of risk in a changing environment. The program is active in East and West Africa, Central Asia and Latin America.

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