

# THE WOMEN WHO BROKE THE POULTRY DISEASE CYCLE IN AFRICA



PHOTO: ROBYN ALDERS, UNIVERSITY OF SYDNEY

Carolina Mwaluko (right) works as a “community vaccinator” in her village in central Tanzania, administering a thermotolerant vaccine as an eye drop to chickens in exchange for a small fee from farmers. Vaccination programs against Newcastle disease, a key production constraint in many developing countries, allow chicken flocks to increase in size and households to benefit from the sale or consumption of poultry products. Since Carolina was trained in May 2014, local traders have noticed the greater availability of chickens for sale and the reduced risk of disease among birds in transit to regional markets. Sustainable Newcastle disease control programs are part of an integrated approach to increasing income and improving nutrition for households in Tanzania and Zambia.

## KEY POINTS

- A team led by Associate Professor Robyn Alders has pioneered an effective way to treat malnutrition among smallholder farmers through the use of a vaccine that protects poultry from Newcastle disease.
- First trialled in three African countries, the method is now being adopted in other countries, including Timor-Leste.

BY DR GIO BRAIDOTTI

**W**hen vaccines work, the effect on human health can be astounding, but vaccines are not limited to tackling human diseases.

Vaccines that protect farm animals are essential to human health too, especially in communities adversely affected by poor nutrition and childhood stunting. The outcomes are especially stark with regard to poultry.

Requiring little in the way of feed or pasture, village chickens provide smallholder farmers with the most readily available source of vital nutrients, including essential amino acids, of all livestock.

Improvements to village poultry value chains not only improve food security and generate income, but also target these benefits to women, who are often responsible for rearing village chickens.

As such, healthy and abundant poultry can improve the status of women and the health of pregnant women, and reverse rates of unacceptably high childhood stunting.

In African countries affected by Newcastle disease each year, wild hosts bring in a virus that can kill up to 90% of flocks in just a few days. It is in places such as Malawi, Mozambique, Tanzania and Zambia, for example, where the link between human and livestock health was once particularly stark.

The turning point came when Professor Peter Spradbrow of the University of Queensland developed a 'thermotolerant' vaccine against Newcastle disease in chickens. Since the vaccine does not require constant refrigeration or rigorous cold chains, it was especially suited for use in remote African communities.

However, creating a viable vaccine delivery system for African smallholder farmers amounted to the extension challenge of a generation.

Central to the success of the vaccination program, created with ACIAR's assistance, was a team of women with a lifelong love of Africa. The women were led by Associate Professor Robyn Alders, who returned to the University of Sydney in 2012.

"The thermotolerant vaccine itself solves only about 25% of the problem," Associate Professor Alders says. "The remainder comes down to the time spent on the ground collaborating with the people who are the intended beneficiaries."

Over seven intense years, starting in 1996, Associate Professor Alders researched, tested and rolled out—all with rigorous community consultation—an appropriate and viable vaccine delivery mechanism and a supply chain that are used to this day. That system continues to be rolled out to even more African nations and is currently being introduced to Timor-Leste.

The program's durability is something Associate Professor Alders deliberately built into it from the start.

"In the history of development work, many vaccination programs have failed once external funding ends and project staff leave," Associate Professor Alders explains. "From the outset of the

Newcastle disease project, the aim was to develop a locally run program with villagers managing the knowledge and resources to maintain healthy flocks of chickens."

Underlying the program's sustainability are local production centres for the vaccine, the creation of a culture of timely vaccination for chickens, fee-charging community-based vaccinators, and culturally appropriate extension material.

In the process, team members have become experts in all matters relating to transporting, handling and distributing the vaccine. That expertise was recently collated into a Cold Chain Manual—the first of its kind in the veterinary world—that includes innovations such as the use of evaporative coolers for the thermotolerant vaccine and mobile, solar-powered refrigerators to transport vaccines to remote areas.

Ensuring the Newcastle disease program's sustainability is a system of cost-recovery in which households pay the equivalent of a few cents for each chicken jabbed—an affordable price given that village chickens can sell for up to A\$12. That choice was driven by important considerations relating to asset ownership and the empowerment of village women. Associate Professor Alders explains that if a woman is given a goat by an NGO, it may be taken away from her since goats are men's business in many parts of the world. "However, if women buy the vaccine, raise chickens and sell five roosters to buy a goat, then the goat is seen to belong to her."

Another benefit from improved flock survival rates is the production and consumption of a unique commodity—a storable superfood in the form of eggs.

"Where Newcastle disease is not controlled, eggs are not available for food but must either be used to hatch chickens or are exclusively eaten by men," Associate Professor Alders says. "That means the disease is robbing communities of a nutritionally dense, balanced food in the midst of unacceptably high rates of childhood stunting."

Cost-recovery has also ensured that vaccinators earn the income needed to purchase more vaccine, thereby ensuring its ongoing production.

The benefits have been widespread and self-perpetuating—an achievement that saw Associate Professor Alders invested as an Officer of the Order of Australia in 2011. However, she is adamant that the program's many successes owe much to the work of the remarkable women who participated in the Newcastle disease project in many guises.

### THE SOCIAL ANTHROPOLOGIST

Described by Associate Professor Alders as her 'greatest asset', Dr Brigitte Bagnol is a social anthropologist who played a pivotal role consulting with smallholder farmers for developing culturally appropriate participatory communication processes, including extension methods.

Dr Bagnol makes it possible to circumvent cultural blunders that can badly compromise the delivery of aid projects. An example is the difficulty that villagers can have reading two-dimensional instructional images if they have done little learning from books. To highly educated Westerners, this is a hidden variable that requires special expertise to recognise and circumvent.

So too are theories of disease that vary from scientists' germ theory and the cynicism surrounding vaccines caused by past experiences in which the arrival of vaccinators coincided with the occurrence of disease.

Dr Bagnol made it possible to confront and overcome such factors and she implemented a model in which villagers are actively involved with participatory monitoring and impact assessment to ensure the vaccination program's long-term viability.

### THE COLD CHAIN SPECIALIST AND VACCINE QUALITY CONTROL

Dr Mary Young, a senior technical officer with the KYEEMA Foundation, has been crucial to ensuring that the thermotolerant Newcastle disease vaccine purchased by vaccinators and farmers is safe and potent. She has done this through her expertise in vaccine production quality control and the establishment and maintenance of cold chains to support the distribution and administration of effective vaccine.

### THE PROJECT MANAGER

The KYEEMA Foundation is a Brisbane-based not-for-profit organisation that supports activities that help to build sustainable communities in rural



PHOTO: SALLY INGLETON

Robyn Alders visits Tanzania's Singida district in July 2012 with Asha, the community's star vaccinator (rear, wearing the yellow cap). "I had just been given this rooster as a gift by Asha," Robyn reports. "I asked her to keep the rooster for me and said that I looked forward to viewing its progeny on my next visit."

and per-urban areas. Celia Greening, executive director of the KYEEMA Foundation, has managed Newcastle disease vaccination projects from her Brisbane office since 2003 when she oversaw the southern Africa Newcastle disease project.

### IN-COUNTRY COUNTERPARTS

Dr Rosa Costa was the director of the Mozambican National Veterinary Research Institute in the 1990s and early 2000s when the Newcastle disease laboratory and field trials were conducted. Her support was vital to the success of the research.

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– Associate Professor Robyn Alders

Wende Maulaga is the current Tanzanian country coordinator of the ACIAR-funded project ‘Strengthening food and nutrition security through family poultry and crop integration in Tanzania and Zambia’, which aims to reduce child undernutrition by improving family poultry and crop production, primarily by working through women smallholder farmers. Ms Maulaga is an animal nutritionist at the Tanzania Veterinary Laboratory Agency, and has a flair for community development.

Dr Hilda Lumbwe is the Zambian country coordinator with the same project. Dr Lumbwe is a veterinarian with a background in poultry health. She is acutely aware that 40% of Zambian children under the age of five years are affected by stunting, 15% are underweight and 6% are affected by wasting caused by nutritional deficiencies. As women are largely responsible for household nutrition they are a primary focus for the project.

Dr Joanita Jong is the head of animal health in the Ministry of Agriculture and Fisheries in Timor-Leste. She is also the country coordinator of the ‘Timor-Leste village poultry and biosecurity project’. This project, which is funded by the Australian Government Department of Foreign Affairs and Trade and implemented by the Department of Agriculture and Water Resources, is adopting the same approach as that being used in Tanzania and Zambia.

### THE FEMALE COMMUNITY ASSISTANTS AND VACCINATORS

Rosemary Ackley (community assistant) and Carolina Mwaluka (poultry vaccinator) are important members of the ACIAR project team, working tirelessly for improved food and nutrition security in their communities.

### THE NEXT GENERATION

The next generation of interdisciplinary researchers are early-career researchers building their research skills in association with ACIAR-associated food and nutrition security research. Julia de Bruyn is an Australian veterinarian researching for the One Health initiative—a global movement to unite human and veterinary medicine. She is undertaking her PhD research in Tanzania in association with ACIAR project FSC/2012/023. Her research is entitled ‘Healthy chickens, healthy children: sustainable contributions to infant nutrition through the control of Newcastle disease in village poultry’.

Dr Johanna Wong, a second Australian veterinary PhD student and One Health researcher, is working on ‘Discovering the links between poultry health and human diets and nutrition in Timor-Leste.’

### THE VACCINATORS

Over time, it became clear that women often make the best village-based vaccinators. Associate Professor Alders says they are more persistent, know the households and tend to be less mobile than young men, who sometimes leave the village in search of paid work. “Communities usually start to preferentially select women once they see their results,” she says.

Although ACIAR covered vaccination costs during the trial phase, the cost-recovery system subsequently used makes the system sustainable. The two cents paid for each bird vaccinated ensures the vaccinators can purchase more vaccine and make a small profit from their work.

The women who farm the village chickens are also able to consult with the village-based vaccinator, gauge demand for the vaccine and ensure its ongoing supply and production.

Although subsidy models exist, and vary from country to country, Associate Professor Alders believes cost recovery works best as government funding can unpredictably dry up. “It better serves women’s prospects for improved livelihoods, nutrition and animal health,” she says. ■

**ACIAR PROJECT:** FSC/2012/023 ‘Strengthening food and nutrition security through family poultry and crop integration in Tanzania and Zambia’

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## PROFILE—KHIN LAY KYU THE SCIENCE OF MAKING A DIFFERENCE



Khin Lay Kyu of the Department of Agricultural Research in Myanmar.

At the Department of Agricultural Research in Myanmar, the perennial pigeon pea is of interest to breeders as much for the plant’s hardy, widely adaptable and heat-tolerant characteristics as for the nutritious grain it produces. Being a legume, the plant can also fertilise soils through fixing nitrogen.

These properties of pigeon pea are of great interest to breeder Khin Lay Kyu, who works for the Department of Agricultural Research and has developed new pigeon pea varieties adapted for farmers in Burma.

She has been involved with ACIAR projects since 2007, particularly working with Professor David Herridge at the University of New England in Australia and Dr K.B. Saxena at the International Crops Research Institute for Semi-Arid Tropics (ICRISAT) in India.

“These projects have helped me to develop skills in plant breeding,” she says. “A highlight of participating in ACIAR projects is that I am part of the international science community and have access to the wisdom and experience of international experts in the field. These connections also allow me to access modern approaches to breeding that I can apply to helping poor farmers of Myanmar.”

The exposure to collaborative, international plant breeding research has opened the way for Khin Lay Kyu to undertake additional training abroad. She completed a master’s degree in India at the Acharya N.G. Ranga Agricultural University and conducted research for her thesis at ICRISAT under the guidance of Dr Saxena.

“There, I learned about the hybrid pigeon-pea breeding program and low-cost production technologies,” she says. “I am now applying these approaches in Myanmar, breeding pigeon pea varieties suitable to our growing conditions and seasons. I want to be a smart plant breeder and develop new, high-yielding varieties that have wide adaptability, high yield and good quality.”

“I just want to work for our farmers and country, and the ACIAR projects are helping me to do this. In Myanmar many of the best agricultural scientists are women, and I hope that they will have as much chance of success and high ranking as men.”