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Good Practices for Family Poultry Production



Sustainable Control of Newcastle Disease in Village Poultry

by

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Country: Australia and Mozambique

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The purpose of the International Network for Family Poultry Development (INFPD) is to share information about poultry production among scientists, researchers, policy makers, educationists, students and development workers and to promote the cause of family poultry production.

Good Practices of Family Poultry Production (GPFPP) are "practices that address environmental, economic and social sustainability for on-farm processes, and result in safe and quality food and non-food agricultural products" (FAO COAG 2003 GAP paper). Sharing information about "Good Practices for Family Poultry Production" that are successfully implemented in countries, regions or development projects is an important objective of the INFPD so that these practices can be replicated in different region based on the farmers' demand.

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1. Introduction

Rural poultry production is recognized as an important activity in all developing countries. They are generally owned and managed by women and children (Guèye 2000; Spradbrow 1993–94). Although the output of traditional village chickens in terms of weight gain and number of eggs per hen per year is low, it is obtained with minimum input in terms of housing, disease control, management and supplementary feeding. There are many constraints to village chicken production (Sonaiya et al. 1999) including a range of bacterial and other viral diseases, internal and external parasites (Permin and Hansen 1998), poor nutrition and predation. The major constraint to production of village chickens in many developing countries is Newcastle disease (ND) (Alexander 1991, Spradbrow 1988). In these countries, circulating strains of ND virus are capable of causing 100% mortality in unprotected flocks. Outbreaks of ND are unpredictable and discourage villagers from paying proper attention to the husbandry and welfare of their chickens. However, in areas where ND is endemic, ND control through vaccination is generally a very cost-effective intervention and given a high priority by farmers.

Besides these, a comprehensive and sustainable Newcastle disease (ND) control program requires a multi-faceted approach that is adapted to local conditions. The table on the following pages provides an overview of the components of a sustainable ND control program, the inputs required and references that provide information on good practices associated with each component.

2. Use of thermotolerant ND vaccines in rural poultry

Experience gained during the implementation of ND control activities involving thermotolerant ND vaccines has shown that a sustainable program is composed of five essential elements:

1. An appropriate vaccine, vaccine technology and vaccine distribution mechanisms;
2. Effective extension materials and methodologies that target veterinary and extension staff as well as community vaccinators and farmers;
3. Simple evaluation and monitoring systems of both technical and socio-economic indicators;
4. Economic sustainability based on the commercialization of the vaccine and vaccination services and the marketing of surplus chickens and eggs; and
5. Support and coordination by relevant government agencies for the promotion and implementation of vaccination programs (Copland and Alders, 2005).

Component/activity	Inputs	References
ND identified as a major constraint	Constraint identification through participatory epidemiology and diagnostic tests	<p>Alders, R.G. and Spradbrow, P.B. 2001. Controlling Newcastle Disease in Village Chickens: a field manual. Canberra. Australian Centre for International Agricultural Research. Monograph 82. 112pp. http://aciar.gov.au/publication/mn082</p> <p>Ameri, A., Hendrickx, S., Jones, B., Mariner, J., Mehta, P. & Pissang, C. 2009. Participatory epidemiology and its application to highly pathogenic avian influenza participatory disease surveillance. A Manual for Participatory Disease Surveillance Practitioners. Nairobi: ILRI/AU-IBAR/VSF-B http://mahider.ilri.org/bitstream/handle/10568/367/BirdFlu-Manual_final.pdf?sequence=2</p> <p>Catley, A., Alders R.G. & Wood, J L.N. 2012. Participatory epidemiology: approaches, methods, experiences. <i>The Veterinary Journal</i>, 191(2), 151-160. http://www.sciencedirect.com/science/article/pii/S1090023311001134</p> <p>FAO. 2000. Manual on participatory epidemiology – methods for the collection of action-oriented epidemiological intelligence. Rome: FAO Animal Health Manual 10. http://www.fao.org/DOCREP/003/X8833E/X8833E00.HTM</p> <p>Mariner, J.C. 1999. Participatory epidemiology: methods for the collection of action-oriented epidemiological intelligence. Vetwork UK, RDP Livestock Services B.V. and FAO http://www.participatoryepidemiology.info/Resource/training.html</p> <p>OIE. 2008. <i>Manual of Diagnostic Tests and Vaccines for Terrestrial Animals</i>. http://www.oie.int/international-standard-setting/terrestrial-manual/</p>
Identification and procurement of appropriate vaccine <ul style="list-style-type: none"> • Live or inactivated vaccine? • Thermotolerant or thermolabile? 	Risk assessment Information and training Laboratory equipment and consumables	<p>Alexander, D.J., Bell, J.G. and Alders, R.G. 2004. Technology Review: Newcastle disease with special emphasis on its effect on village chickens. FAO Animal Production and Health Paper No. 161. Rome, FAO. 63pp. http://www.fao.org/docrep/006/y5162e/y5162e00.htm</p> <p>OIE. 2008. <i>Manual of Diagnostic Tests and Vaccines for Terrestrial Animals</i>. http://www.oie.int/international-standard-setting/terrestrial-manual/</p>

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Component/activity	Inputs	References
<ul style="list-style-type: none"> • Import? • Produce locally? 		<p>Young, M., Alders, R., Spradbrow, P., Grimes, S., Dias, P., da Silva, A. and Lobo, Q. 2002. Controlling Newcastle Disease in Village Chickens: A Laboratory Manual. ACIAR Monograph N° 87, 142pp. http://aciar.gov.au/publication/mn087</p>
Vaccine quality control <ul style="list-style-type: none"> • Efficacy • Potency • Safety • Registration with national authorities 	Training and information Laboratory equipment and consumables	<p>OIE. 2008. <i>Manual of Diagnostic Tests and Vaccines for Terrestrial Animals.</i> http://www.oie.int/international-standard-setting/terrestrial-manual/</p> <p>Young, M., Alders, R., Spradbrow, P., Grimes, S., Dias, P., da Silva, A. and Lobo, Q. 2012. 2nd edn. Controlling Newcastle Disease in Village Chickens: A Laboratory Manual. ACIAR Monograph N° 87, 143pp. http://aciar.gov.au/publication/mn087</p>
Central store of vaccine	Establishment and/or maintenance of cold chain	<p>Chicamisse, M., Harun, M., Alders, R.G. and Young, M.P. 2009. Evaluation of the cold chain encountered by 'wet' I-2 Newcastle disease vaccine from the Vaccine Production Department to the village chicken in Mozambique. In: Alders R.G., Spradbrow P.B. and Young M.P. (eds) Village chickens, poverty alleviation and the sustainable control of Newcastle disease. Proceedings of an international conference held in Dar es Salaam, Tanzania, 5–7 October 2005. ACIAR Proceedings No. 131, pp 113–119. http://aciar.gov.au/files/node/11133/PR131%20part%201.pdf</p> <p>DHA. 2005. National Vaccine Storage Guidelines: Strive for Five. Australian Department of Health and Aging, Canberra. http://www.immunise.health.gov.au/internet/immunise/publishing.nsf/content/DF94731AD8CBF34ECA2575BD001C8129/\$File/strive-4-five.pdf</p> <p>Young, M., Alders, R., Spradbrow, P., Grimes, S., Dias, P., da Silva, A. and Lobo, Q. 2012. 2nd edn. Controlling Newcastle Disease in Village Chickens: A Laboratory Manual. ACIAR Monograph N° 87, 143pp. http://aciar.gov.au/publication/mn087</p>
Distribution of effective vaccine and	Training and extension material	Alders, R., dos Anjos, F., Bagnol, B., Fumo, A., Mata, B. and Young, M. 2002; 2 nd edn 2003. Controlling Newcastle Disease in Village Chickens: A Training

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Component/activity	Inputs	References
extension material <ul style="list-style-type: none"> • Appropriate accounting and cost-recovery procedures • Improved husbandry practices 	Establishment and/or maintenance of cold chain to provincial, district and community levels Establish and maintain cost recovery system	Manual. ACIAR Monograph N° 86, 128 pp. http://aciar.gov.au/publication/mn086 Alders, R.G., Bagnol, B. and Young, M.P. 2010. Technically sound and sustainable Newcastle disease control in village chickens: lessons learnt over fifteen years. World's Poultry Science Journal 66:433-440.
Informed and motivated support personnel (men and women)	Continuing education for veterinarians, subject matter specialists, livestock officers, extension workers Gender sensitive methodologies	Ahlers, C., Alders, R.G., Bagnol, B., Cambaza, A.B., Harun, M., Mgomezulu, R., Msami, H., Pym, B., Wegener, P., Wethli, E. and Young, M. 2009. Improving village chicken production: a manual for field workers and trainers. ACIAR Monograph No. 139, 194 pp. http://aciar.gov.au/publication/mn139 Alders, R., dos Anjos, F., Bagnol, B., Fumo, A., Mata, B. and Young, M. 2002; 2 nd edn 2003. Controlling Newcastle Disease in Village Chickens: A Training Manual. ACIAR Monograph N° 86, 128 pp. http://aciar.gov.au/publication/mn086
Informed and enthusiastic farmers (men and women)	Awareness raising of farmers Selection and training of community vaccinators (50% female) Gender sensitive methodologies	Bagnol, B. 2009. Bicycles, Boots, T-shirts and Percentage Over Payment of Vaccination: What Role for Community Leaders? In: Alders, R.G.; Spradbrow, P. B. and Young, M. P (eds). 2009. Village Chickens, Poverty Alleviation and Sustainable Control of Newcastle Disease. Canberra: Australian Centre for International Agricultural Research. ACIAR Proceedings N° 131: 102-107. http://aciar.gov.au/publication/pr131 Bagnol, B. 2009. Improving Village Chicken Production by Employing Effective Gender Sensitive Methodologies. In: Alders, R.G.; Spradbrow, P. B. and Young, M. P (eds). Village Chickens, Poverty Alleviation and Sustainable Control of Newcastle Disease. Canberra: Australian Centre for

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Component/activity	Inputs	References
		<p>International Agricultural Research. ACIAR Proceedings N° 131: 35-42. http://aciar.gov.au/publication/pr131</p> <p>Alders, R.G. and Bagnol, B. 2007. Effective communication: the key to efficient HPAI prevention and control. World's Poultry Science Journal 63:139-147.</p> <p>Alders, R.G. and Bagnol, B. 2000. Communicating with farmers - a vital element in the control of Newcastle disease in village chickens. Proceedings of the XXI World's Poultry Congress, Montreal, August 20 -24, 2000. Abstract 13.01.</p>
Administration of effective vaccine to healthy chickens	<p>Well-organized vaccination campaigns</p> <p>Well-trained and equipped vaccinators</p>	<p>Alders, R., dos Anjos, F., Bagnol, B., Fumo, A., Mata, B. and Young, M. 2002; 2nd edn 2003. Controlling Newcastle Disease in Village Chickens: A Training Manual. ACIAR Monograph N° 86, 128 pp. http://aciar.gov.au/publication/mn086</p> <p>SAPPLPP. 2012. South Asia Pro-Poor Livestock Policy Programme (www.sapplpp.org). Lessons learnt related to backyard poultry keeping. http://sapplpp.org/lessonslearnt.</p>
<p>Gender sensitive monitoring and evaluation of the ND control program</p> <ul style="list-style-type: none"> • Vaccine quality, distribution and administration • ND surveillance data • Socio-economic data • Participatory M&E with communities 	<p>ND control data and analysis</p> <ul style="list-style-type: none"> • Vaccine quality control • No. of vaccine doses distributed • No. of vaccines doses administered • ND surveillance data and poultry mortality • Household and 	<p>Bagnol, B. 2007. Participatory tools for assessment and monitoring of poultry raising activities and animal disease control. FAO HPAI Communication Workshop 22 January 2007, Bangkok: FAO. http://www.participatoryepidemiology.info/userfiles/Participatory%20Tools_9_03_08.pdf</p> <p>Catley, A. 2005. Participatory epidemiology. A guide for trainers. Nairobi: African Union/Interafrican Bureau for Animal Resources. http://www.participatoryepidemiology.info/PE%20Guide%20electronic%20copy.pdf</p> <p>Catley, A., Burns, J., Abebe, D. & Suji, O. 2007. Participatory impact assessment. A guide for practitioners. Boston: Tufts University. Feinstein International Center http://sites.tufts.edu/feinstein/2008/participatory-impact-assessment</p>

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Component/activity	Inputs	References
	<ul style="list-style-type: none"> community socio-economic data • Participatory rural appraisal and participatory impact assessment 	
Central data bases (veterinary and socio-economic)	Training and information	OIE. 2012. World Animal Health Information Database (WAHID) Interface. http://web.oie.int/wahis/public.php?page=home
Response to outbreaks of ND	Policy development Training and equipment supply	AHA. 2011. Newcastle disease strategy. Animal Health Australia, Canberra. http://www.animalhealthaustralia.com.au/wp-content/uploads/2011/04/ND3-2-21FINAL2May11.pdf FAO. 2011. Good Emergency Management Practices: The Essentials. Edited by Nick Honhold, Ian Douglas, William Geering, Arnon Shimshoni and Juan Lubroth. FAO Animal Production and Health Manual No. 11. Rome. http://www.fao.org/docrep/014/ba0137e/ba0137e00.pdf OIE. 2012. Disease Control Measures. http://web.oie.int/wahis/public.php?page=control

3. Why has this good practice worked?

The good practice has worked because the key in-country stakeholders (from Ministries of Agriculture to animal health technicians to male and female farmers) have recognised ND as a serious constraint to village poultry production and have been involved in the implementation of the program from the beginning. The model was developed over 10 years and so provided time to learn lessons along the way while evaluating the robustness of the approach. Particular attention was paid to capacity building of all key actors and to involving them in the monitoring and evaluation process. The importance of setting up cost-recovery mechanisms that ensure that the vaccine production laboratory or importing institution always has funds to supply the vaccine at key times during the year has been found to be a key element of success. Significant attention was also paid to training in the conservation and transport of the thermotolerant vaccine as it is important for distributors and users to understand the thermal limits of the biological product. For the thermotolerant ND vaccine to deliver optimal results, it is important that the recommended storage temperatures and shelf-life be observed and that freeze-thaw cycles are avoided.

4. Scope of replication and sustainability

Key recommendations to support technically sound and sustainable ND control programs in village chickens include:

- Veterinary pharmaceutical companies should be encouraged to develop and observe a code of conduct that supports the supply of appropriate vaccine with an adequate shelf life, instructions in local languages, the use of temperature indicators in the vaccine containers and discourages the payment of commission on the purchase of vaccine;
- Quality assurance activities should be built into all vaccination programs to improve cost-efficiency. These activities should include post-vaccination serological monitoring on a representative sample of birds especially when a new vaccine or new disease control program is introduced;
- Participation of farmers (male and female) in the monitoring and evaluation of the effectiveness of vaccination campaigns; and
- Active collaboration with the Ministries of Agriculture, Health and Education in village poultry improvement programs (Alders et al. 2010).

5. Conclusion and lessons learnt

The implementation of effective ND control programs in village poultry in Asia, Africa and Latin America has resulted in increased poultry numbers, increased household purchasing power, increased home consumption of

poultry products and increased decision-making power for women. The use of participatory methodologies and robust attention to quality assurance activities has been critical to the success of these programs.

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