Feature

ONE HEALTH

Improving animal health for poverty alleviation and sustainable livelihoods

Animals are vital to ensuring food security for individuals, families and communities in countries around the world. In this, the latest article in Veterinary Record’s series promoting One Health, Andy Stringer, director of veterinary programmes at the Society for the Protection of Animals Abroad, discusses how improving animal health, particularly of poultry and working equids, has the potential to reduce poverty and promote food security and sustainable livelihoods in low-income countries.

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A woman living in rural Ethiopia feeds the household’s chickens. Poultry play an important economic, nutritional and sociocultural role in the livelihoods of poor rural households in many low-income countries.

Image: Marisol Collins, University of Liverpool

‘About 90 per cent of the world’s extremely poor are small-scale farmers’

THE United Nations Millennium Development Goals (MDGs), agreed in 2000, were a set of eight targets to respond to the world’s main development challenges. Included in the MDGs was the aim to ‘eradicate extreme poverty and hunger’ (Anon 2014a). By 2050, the human population is likely to increase to over nine billion (Anon 2012). Millions of households depend on agriculture as part of their livelihoods, and about 90 per cent of the world’s extremely poor are small-scale farmers (FAO 2012). An estimated 2.6 billion people in the developing world have to live on less than $2 a day and, of these, about 1.4 billion are extremely poor – surviving on less than $1.25 a day (FAO 2012).

Poverty reduction requires reducing the number of people who are poor, as well as the extent of their deprivation. To do this, the root causes and structural factors of poverty must be addressed. Poverty is intimately associated with malnutrition, with global estimates suggesting that around 925 million people were undernourished in 2010 (FAO 2012). Malnutrition affects the height and weight of affected populations and is measured by the ratio of weight, height and age. Stunting (low height for age) in children under the age of five increases the risk of concurrent disease and affects physical and cognitive development capacity, as well as productivity in adulthood (Alders and others 2015).

Preventing malnutrition is therefore of importance to a multitude of human, social and economic stakeholders.

Food security exists when populations have consistent access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO 2009). Animals are of considerable importance as a route out of poverty, ensuring food security and sustainable livelihoods; solutions to these problems may therefore include approaches derived from a One Health perspective.

Animals and livelihoods

In countries around the globe, animals are vital to ensuring food security for individuals, families and communities through livelihood processes (Bazeley and others 1999, Anon 2002, Perry and Grace 2009, Okello and others 2011, FAO 2012). One approach to understanding how animals and livelihoods are linked is the UK Department for International Development’s sustainable livelihoods framework (DFID 1999). The livelihoods framework (Fig 1) identifies five core asset categories – human capital, natural capital, financial capital, social capital and physical capital – on which livelihoods are built. These assets are then used in a number of processes that determine the livelihood status of the household and the wellbeing of its members. Increasing access to a range of assets, whether by ownership or by the right to use them, and use of assets through these processes, is the primary mechanism to sustainable livelihoods and human wellbeing.

Animals can contribute to several asset types and livelihoods through processes including the direct production of produce for consumption (for example, meat, eggs...
Fig 1: The Department for International Development’s Sustainable Livelihoods Framework, showing the main components that influence livelihoods and the relationships between them.

and milk), providing services for other households that can be exchanged for goods or cash, and, if necessary, the animal assets can be liquidated. Poverty analyses have shown that people’s ability to escape from poverty is critically dependent upon their access to assets (DFID 1999).

Disruption to livelihoods through shocks results in a vulnerable livelihood status and potential food insecurity. Shocks that can affect animals include climatic events (for example, droughts or floods) and animal disease. These shocks can result in poor health and condition of animals, thereby lowering their productivity. This may result in animal death, a reduction in the volume of produce consumed by the household, or reduced value of the animal, and therefore reduced opportunities for the household.

There is increasing evidence that improving access of poor farmers to animal health services will improve their livelihoods. For improvements to be made to animal health in low-income countries by primary animal healthcare services, key criteria must be addressed: the affordability, accessibility, availability, acceptability and quality of these animal health services are essential for sustainability (Catley and Leyland 2001, Catley and others 2002). Supporting animal health to mitigate the effect of shocks on households is an important role of the animal health sector in maintaining the livelihoods and, ultimately, food security, of the world’s poorest populations.

One Health definitions and approaches have been explored in depth in previous papers (Okello and others 2011, Gibbs 2014), but one definition with relevance to this article is ‘the collaborative effort of multiple disciplines working locally, nationally, and globally to attain optimal health for people, animals and the environment’ (AVMA 2008). A collaborative approach by experts in animal health, marketing and economics, and integration with human and social science counterparts, is necessary to strengthen all aspects of the animal health sector. While many animal species are found in smallholder systems in low-income countries, this article explores how improving the health of two such groups of animals, poultry and working equids (species often given less recognition than cattle, sheep and goats), has the potential to promote poverty reduction, food security and sustainable livelihoods.

Poultry

Poultry play an important economic, nutritional and sociocultural role in the livelihoods of poor rural households in many low-income countries (Tadelle and Ogle 2001) and have the potential to play a significant role in poverty alleviation and food security (Alders 2004, Dolberg 2008, Alders and Pym 2009, Anon 2014b). Family poultry account for up to 80 per cent of poultry stocks in low-income countries where households raise poultry in small numbers (FAO 2014). It has been shown that households can escape from poverty by diversifying on-farm incomes through livestock, including poultry (Kristjanson and others 2004). Livestock (chickens, sheep, goats and cattle) play a key role in providing pathways out of poverty, with the purchasing of poultry as one of the earliest stages of progress (Kristjanson and others 2004). Income derived from poultry can be used to help progress out of poverty, including making additional investment in animals. Given that investment in large animal stock is typically beyond the means of the poorest households (Kristjanson and others 2004), poultry are potentially an accessible option to the poorest in society. Indeed, the identification of farmers whose only livestock are poultry can, in many cases, be a tool for targeting very poor farming households (Dolberg 2003).

Numerous varieties of indigenous poultry breeds are found in low-income countries and are kept under village scavenging production systems (Luu and others 2013). Poultry provide animal protein in the form of meat and eggs and can be sold or bartered to meet essential family needs such as medicine, clothes and school fees (Alders and Pym 2009). Output from village poultry in terms of weight gain and number of eggs per hen per year is often low when compared to intensively raised birds, but production efficiency is moderate as there is minimal input into these husbandry systems (Alders and Spradl拥ow 2001, Alders and Pym 2009). Poultry are especially important to individuals who do not own other animals, landless people and women, who often control the income from sales (Anon 2014b).

However, despite these indigenous breeds being well adapted to the local conditions, low genetic potential and poor levels of husbandry mean that many of these breeds grow slowly and are poor producers of small eggs (Anon 2014b). Poor management and limited resources hinder the development of chicken production by reducing outputs and predisposing birds to disease outbreaks (Halima and others 2007, Dinka and others 2010).

Infectious diseases have a major impact on poultry productivity (Halima and others 2007, Dinka and others 2010, Luu and others 2013). Limited extension and veterinary services are also important constraints to village chicken production (Luu and others 2015). For the smallholder, disease outbreaks can mean a dramatic reduction in livelihood opportunities and increased vulnerability. Poultry health can be improved through the introduction of genetically improved indigenous breeds (with better meat and egg production), disease control strategies (improved biosecurity and vaccination) to mitigate disease risks, and the training of farmers in...
flock management (including egg handling and storage) and produce marketing to maximise additional benefits for the household (FAO 2014).

Improving genetic resistance to infectious diseases through selective breeding programmes presents a valuable opportunity to improve the productivity of poultry production systems (Anon 2014b). Reductions in mortality through vaccination programmes (Alexander and others 2004) and improved management that protects young chicks for the first six to eight weeks of life are of considerable importance (Dolberg 2003). The implementation of effective control programmes for Newcastle disease in low-income countries has resulted in numerous benefits for households, including increased chicken numbers, increased household purchasing power, increased home consumption of chicken products and increased decision-making power for women (Alders and Pym 2009). These benefits can be viewed as contributing to a number of livelihood assets within the household (for example, financial capital and social capital), which, with appropriate processes and livelihood strategies, can achieve positive livelihood outcomes such as increased income and improved food security.

Simply increasing the number of poultry will not always make an enterprise more profitable (Alders 2004). Care must be taken to ensure that inputs and expertise are available and affordable (as attempts to intensify poultry production may not end up being sustainable) and that markets exist and are accessible. As the density of a poultry population increases, more sophisticated disease control measures are required (Alders and Pym 2009). For programmes to be sustainable and, therefore, to continue to support livelihoods, an increase in production will require a market for the sale of products (for example, eggs and live birds) so that producers are able to pay for production inputs (Alders and Pym 2009).

Village poultry improvement programmes have the potential to contribute to each of the MDGs, not just the goal of eradicating extreme poverty and hunger, and to do so for the most vulnerable households in low-income countries (Alders and Pym 2009). However, poultry have received little attention in rural development and food security agendas until recently, so their potential is underused (Duguma 2009).

**Working equids**

Working equids have an essential role in the livelihoods of millions of individuals worldwide (Perry and others 2002, Thornton and others 2002). It is estimated that the total world equine population is around 112 million (approximately 58.5 million horses, 43 million donkeys and 10.5 million mules), although this is likely to be an underestimate (FAO 2013). These equids perform numerous vital tasks, including the transportation of goods, people and construction materials, as well as being used in agricultural and tourism activities (Garuma and others 2007, Pritchard 2010, Stringer and others 2011).

Working equids are estimated to support between 300 and 600 million people globally. Many of these people will be in the so-called ’bottom billion’ (Collier 2007). Equids are often used in the most marginalised of communities, and are of particular importance to vulnerable groups, including the landless. They also help to reduce the daily drudgery of backbreaking tasks for women and children especially.

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Working equids are largely absent from agricultural and animal health policy, research and educational programmes and agendas, and there is a distinct lack of recognition of working animals by policymakers (Pritchard 2010). Working equids suffer from low productivity as a result of prevalent infectious diseases and diseases associated with poor management practices compounded by low nutritional standards. The problems faced by working equids can be addressed through increasing the recognition of working equids among legislators and administrators and by working to reduce the high prevalence of health and welfare problems through appropriate primary animal health services (Pritchard 2010).

Working equids can increase access to and ownership of different capitals, including human, social and natural capital. At a household level, human capital varies according to many factors, including working equid ownership. Benefits from working equid ownership include reducing labour burdens, such as carrying firewood and water, supporting agricultural activities and creating opportunities for women to diversify their income streams. In some countries, working equids are used to transport women to health centres in the late stages of pregnancy, thus reducing the risk of maternal complications at birth.

Working equids also increase access to social capital, the social resources that individuals use in pursuit of their livelihood objectives. Working equids provide greater access to networks and increase the connectedness within social structures. They are used to build relationships of trust and provide the basis for informal safety nets among poor people. Working equids also have the potential to reduce the vulnerability of livelihoods due to climatic events (changes in natural capital). In Africa, many subsistence smallholder farmers have a high dependency on agricultural production for survival and are at risk from climatic events. Using working equids...
produces greater farm outputs than working farmland by hand, with working equids also being used for off-farm diversification. The ownership of a healthy and productive working equid contributes to livelihood assets within the household, and therefore positive livelihood outcomes. Working equids contribute towards the MDG's aim of poverty reduction, as well as gender equality, improved maternal health and environmental stability.

Conclusion

In the first article in Veterinary Record’s series promoting One Health, Paul Gibbs included a diagram to illustrate selected applications of One Health to date (Gibbs 2014). Those applications largely apply to the fields of zoonotic disease control and translational medicine and, to a much lesser extent, to global health. Development in rural areas over recent decades has seen a gradual trend toward smallholder farmer participation as an essential ingredient in the development process (Pretty 1995). The degree to which smallholder farmers are involved in the development process is an important factor in determining long-term sustainability. For further success, projects should continue to move away from top-down, technology-driven interventions, and focus on holistic, participatory and community-based programmes, which are community led and driven, with increasing recognition given to local knowledge and experience (Chambers 1983, Kumar 2002, FAO 2012). There is great scope to use One Health approaches at the interface between animal health and international development goals, such as poverty reduction, food security and sustainable livelihoods. However, it will require the paradigm shift discussed by Gibbs (2014) for a ‘wider and deeper commitment to interdisciplinary action addressing the protection and needs of society in the 21st century’.

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References


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Image: Andy Stringer

A young girl from a village in Uganda collecting water for use in the home. Ownership of working equids reduces the daily labour burdens for women and children, such as carrying firewood and water.
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