

Factors limiting production efficiency and profitability from smallholder poultry production

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The efficiency and profitability of family enterprises using indigenous poultry are limited by disease, production constraints, and external factors. The limitations caused by viral diseases, notably Newcastle disease, avian influenza, Gumboro disease and fowl pox, can be largely alleviated through the use of vaccination programmes adapted to the local prevalence of diseases. Once disease is controlled, feed becomes a significant limiting factor which judicious feeding of chicks during the first four weeks of life can overcome. Loss from predators can be addressed by suitable housing for young chicks. The number of eggs that can be incubated in each batch and the number of batches that can be raised by a hen each year can be countered through the provision of a suitable hatching trays, and interventions to stimulate a rapid return to lay by hens.

Keywords: smallholder; poultry; profitability; production

Introduction

The first point that needs to be made in the context of this review is that production efficiency and profitability are not the same thing as production rates. The average industrial broiler grows to 2 kg in about 6 weeks, and the average industrial hen lays about 250 or more eggs per year. This far outstrips any production rates that traditional indigenous breed family poultry are capable of. However the production efficiency of the commercial birds, from the smallholder farmer's point of view, can be thought of as far lower, because all the feed has to be purchased, whereas the small scale family poultry finds its own feed. This key advantage of small scale, freely roaming poultry over their industrial kin has been emphasized by Dolberg (2007). More important still is the profitability: not the profitability per farm or per bird, but the profitability per unit of money invested – the benefit/cost ratio.

Another indicator of the profitability of family poultry applicable in very poor communities has been suggested as the percentage of households that are above the

poverty line due to the contribution of family poultry. Forty years ago there were misguided attempts to 'improve' indigenous poultry in Africa through 'cockerel exchange' programmes, according to the false assumption that genetics were limiting production efficiency, in emulation of the burgeoning industrialisation of poultry being pioneered in the Netherlands. It is generally agreed now that these programmes failed, and yet people still speak about 'germ plasm' being a limiting factor for family poultry (Sharma, 2007). So, before going on to list the factors that do actually limit production efficiency of family poultry, it must be made clear that genetic make up is not one of them.

Disease

Prevention of viral diseases is something the smallholder can do to increase the profitability of family poultry. A study evaluating the effect of vaccination against Newcastle disease in thirteen different African countries showed a substantial return on investment in all the countries (Dwinger, 2006). That doesn't mean to say that Newcastle disease is always a constraint to family poultry: there have been rare reports of situations where it has not had a significant impact over several years. The key to increasing profitability is to know which diseases are prevalent in the area in question. For example in the Southern districts of Bangladesh it was found that the major viral constraints, apart from Newcastle disease, were fowl pox, which affected chicks being raised by broody hens, and Gumboro disease seen in growing birds. At present in Java and some other parts of Indonesia, highly pathogenic avian influenza (HPAI) is a serious constraint to family poultry production. In this case vaccination is not as easy as it is for Newcastle disease due to antigenic variability of the virus. It appears that the HPAI virus is subject to greater antigenic variation than the low pathogenic virus naturally occurring in ducks from which it arose.

The reason why viral diseases have been mentioned first is that they are mostly preventable by vaccination. That doesn't mean that profitability can not be increased by tackling other diseases. For example, it has been argued that reducing the parasite burden on poultry, particularly intestinal worms, can increase production efficiency. However, there are some diseases that do have an impact on relative profit margins in large scale intensively housed poultry production that are probably not significant in the natural situation of freely roaming poultry. Such diseases include adenovirus infections and infectious laryngotracheitis, although it should be emphasised that systematic research to eliminate this possibility has not yet been carried out.

Feed

When natural losses due to disease have been attenuated, then feed becomes a constraint. This may appear to contradict what was said at the beginning about family poultry being able to find their own feed, but in fact interventions targeted only at specific ages can overcome this constraint. Creep feeding growing chicks combined with vaccination dramatically improves their survival rate. This can be done either by feeding the chicks while protecting them in a hemispherical basket, or by housing and feeding them. The principle is that the chicks are given feed which the adult birds do not have access to. The choice of protection depends on the prevailing situation regarding predators.

Predators

In some areas predators can be a significant cause of loss of young as well as adult birds. Predators can include birds of prey, reptiles, mammals such as foxes, and human thieves. This constraint can be overcome by the provision of night housing. The form of this housing will depend on the materials available locally and the nature of the predation.

Number of chicks produced

The number of eggs that a hen can lay is constrained by the periods it spends brooding and rearing chicks (Prasetyo *et al.*, 1985.) By separating chicks from the hen soon after hatching it is possible to more than double the egg production without any genetic change, because the laying, incubating and rearing is completed in only 66 instead of 130 days. Another constraint is the number of eggs that can be incubated in one batch. This can be increased by the provision of a hatching basket specially made out of mud or straw (Sarkar and Golam, 2009).

Control measures

Finally, smallholder poultry production can be constrained by misguided efforts to control zoonotic disease. For example, in the current epidemic of the H5N1 avian influenza virus, there has been an attempt to ban family poultry farming in Egypt where the virus is prevalent along the Nile River. This has only increased the risk to people due to the concealment of poultry in houses to avoid the ban. Similarly small scale poultry has been banned in Jakarta, Indonesia. Fortunately, the ban has been largely ignored. Although the virus is unquestionably present in family poultry, it seems likely that it originated in the convergence of large scale industrial broiler farms and waterfowl, the natural host for avian influenza virus (Greger, 2006). If family poultry were to be systematically banned – if it was possible – it might alleviate in the short term the propagation of a particular virus, but in the long term it could only increase the probability of the emergence of unnatural pathogenic variants due to the shifting of production to the large scale industrial system, not to mention the devastating effect on the world's poultry genetic heritage. Although it is often said, and is sometimes true, that biosecurity is better in the large scale systems, it is forgotten that this is because the danger is so much greater in these systems.

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References

- DOLBERG, F. (2007) Poultry Production for livelihood improvement and poverty alleviation. Presented at *Poultry in the 21st Century*, FAO Animal Production and Health Division, Bangkok, November 5-7 2007.
- DWINGER, R.H. (2006) Improving farmyard poultry production in Africa: Interventions and their economic assessment. International Atomic Energy Agency, Vienna.

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GREGER, M. (2006) Bird flu, a virus of our own hatching. Lantern Books, New York, NY.

PRASETYO, T., SUBIHARTA, W.D. and SABRABI, M. (1985) The effect of chick and hen separation on village chicken egg productivity. p.22, *Research report 1984-1985*, Research Institute for Animal Production, Bogor, Indonesia.

SARKAR, K. and GOLAM, M. (2009) A move from subsistence to semi-commercial family poultry farming with local chickens: effective strategies for family poultry in Bangladesh. *World's Poultry Science Journal* **65**: 251-259.

SHARMA, R.K. (2007) Role and relevance of rural family poultry in developing countries with special reference to India. *Family Poultry* **17**: 35-40.