

Case study

Enhancing rural livelihoods and nutrition through higher welfare poultry production in India

Humane, sustainable farming using local resources can make huge differences to the rural poor, women and local economies, tackling poverty reduction, food security and nutrition in rural areas, while maintaining environmental protection.

Industrial livestock production has dramatically changed the nature of the food we eat and has had a major impact on the welfare of billions of animals, the environment and our use of natural resources. Of particular concern is the production of animal feed, which requires around 30 per cent of the world's arable land.¹ In developing countries such as India, coarse grains are part of the staple diet of the human population; therefore livestock dependent on grain is, in some form, in direct competition for these resources.

In India, poultry production more than trebled between 1995 and 2007. With an annual egg production growth rate of five per cent, India is now the world's third largest producer of eggs.² Demand for and production of poultry products is growing faster than any other type of meat, fuelled mainly by the growth of a small number of large commercial producers using high yield breeds and industrial production methods.

However, this spectacular expansion in India's poultry sector has so far only marginally contributed to poverty reduction and improved nutrition, particularly in rural areas. There remain an estimated 30 million rural households in India living below the poverty line, where women raise poultry as a traditional activity.

This case study demonstrates that there are humane and economically viable alternatives to intensive egg production aimed at the urban market. It shows a sustainable poultry model suited to improving the livelihoods and nutrition of poor rural households that is simultaneously better for animal welfare and less reliant on buying in feed from external providers.



Mr Kapur, Chairman of Keggfarms, with Kuroilers reared in a backyard system. Rearing this hardy bird encourages women to become more market-oriented and improves household food security and nutrition.

The Kuroiler breed

By 1993 the company had created a new breed of bird – the extraordinary dual purpose ‘Kuroiler’. Unlike commercial poultry breeds specifically bred for rapid weight gain or high egg production in confinement systems and reliant on high external inputs, the dual-purpose Kuroiler can thrive on agricultural by-products and fly and run quicker from predators, and therefore live longer. This is a breed capable of expressing its performance potential in a resource-poor, foraging village environment: the Kuroiler is capable of achieving 1kg of body weight in eight weeks, 1.8–1.9kg (female) and 2.3–2.4kg (male) at 20 weeks, and producing over 150 eggs in semi-scavenging free-range conditions.

The success of this breed and the new business model led the company to phase out single purpose broilers and laying hens in 2001–2002 after being in the commercial broiler business for more than three decades.

Keggfarms estimates that the sale of Kuroiler day-old chicks touched one million in the first year alone. From a modest exploratory beginning, the annual production of day-old chicks is currently at 20 million and expected to grow at a rate of 10 to 15 per cent annually. Additionally, approximately another five million Kuroilers are produced and distributed by State Governments from parents supplied by Keggfarms. Kuroilers are distributed to around one million households located in some of the most remote parts of the country. The supply chain provides a commodity which serves the poorest in a financially sustainable manner without the support of any external agency; Keggfarms link the Kuroiler to improvements in the lives of more than one million households in some of India’s poorest regions.

Keggfarms

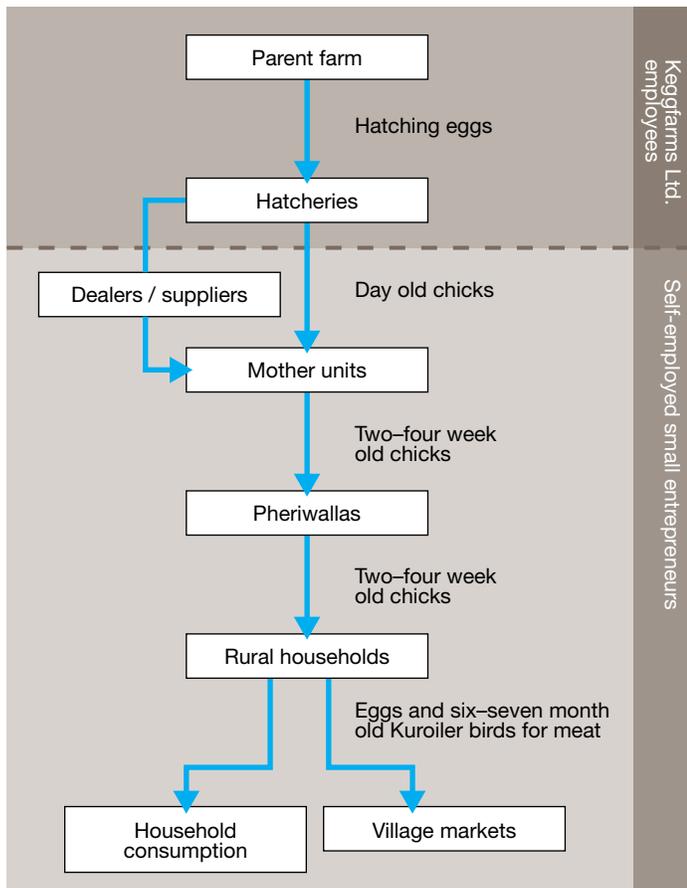
Keggfarms was founded in 1967 and pioneered genetic poultry breeding in India, producing high yielding stock suited to local environmental conditions. In 1991 a previously highly-protected trade regime was opened to domestic and international players, with significant liberalization of industrial and foreign trade policies.³ The company faced three choices:

1. Scale up operations to compete with multinationals
2. Partner with a multinational
3. Differentiate their product.

Keggfarms decided to take the third option, by establishing a sustainable business model aimed at the rural poultry sector.

High input/high output broiler or laying hen ⁴	Dual purpose Kuroiler
Different breeds for meat and egg production. Male chicks of laying hens killed at birth. Significant animal welfare problems in the broiler parent stock that need to be feed-restricted in order to remain fertile.	Dual-purpose breed saves killing male chicks and poses significantly fewer animal welfare problems during the breeding process.
1.5–1.8kg in 41 days. Broilers bred for fast weight gain and raised in industrial systems with high stocking densities frequently suffer painful leg disorders.	1.8–1.9kg (female) and 2.3–2.4kg (male) at 20 weeks. While most are reared free-range, a few are raised confined but observed to be provided with suitable space, ventilation and bedding and many are let out a few hours per day.
Over 300 eggs per year, mostly in cage systems.	150 eggs per year in semi-scavenging conditions or 200 in village farm conditions.
Mortality rates around four per cent but highly dependent on management.	Mortality rates reported as high as 20 per cent, many due to Newcastle disease; improvement of vaccination levels at the mother unit has been crucial to reduce these values.
Corn and soybean feed is the main cost component of the enterprise making up 55–64 per cent of variable costs.	Nutrition from scavenging, household scraps, agriculture by-products and small amounts of coarse grains making up around 33–48 per cent of total costs in a low cost enterprise.

The poultry value chain



Keggfarms devised a business operation that delivers chicks to the householder's doorstep and reduces early chick mortality.

Keggfarms supplies day-old chicks to 1,500 'mother units' distributed across the states where it operates, each a micro-enterprise. The mother units raise the birds for two to four weeks and provide immunisation, therefore reducing early chick mortality in village households. Owned by local entrepreneurs, mother units keep anything between 50 to 2,000 birds at one time and sell them to mobile vendors or 'pheriwallas' who distribute them to nearby villages.

Typically, the mother unit entrepreneur and the pheriwallas make a profit of approximately three to four rupees (Rs.) per bird. All the stakeholders in the chain benefit – Keggfarms, dealers, owners of the mother units, vendors and village farmers.

This characteristic of the Keggfarms model prompted the *Business India Innovation Awards* jury to note that: "The business is sustainable because it has created rural entrepreneurs. A great deal of scalability happens when such entrepreneurship is created."⁵

The dual-purpose Kuroiler bird thrives on agricultural by-products and achieves performance potential in resource poor environments.

Results

The outcomes of raising Kuroilers were studied in 260 households, 35 mother units and 37 vendors in four districts of West Bengal.⁶

Similar to most low income countries, household poultry in India finds special favour with the poor (landless, marginal and small farmers) and disadvantaged communities and is dominated by women rearers. Of the households sampled, most work as daily wage workers on construction sites or other people's farms. These households rely on small-scale poultry keeping to supplement and enhance their livelihoods and nutrition.

Food security levels in the sample are very low. Even among the wealthier households, approximately 16 per cent did not have secure access to food all year around; the proportion was as high as 85 per cent in the poorest households. The monsoon months – July to October – were identified as the months of acute food scarcity.

The size of the enterprise increased with the economic status of the household and with the total number of Kuroilers sold and consumed domestically, increasing from nine birds in the poorest households to 17 in the wealthiest. Accounting for domestic consumption of meat and eggs, the impact of semi-scavenging rearing has increased net income per household by between Rs.1,100 and 3,500 per annum, depending on how well the value chain is established, and with even the poorest having highest net profit margins. Rates of return on investment varied between 136 and 548 per cent.

The share of Kuroiler meat consumed at home as a proportion of the total production increased dramatically with income. In the poorest households only 10 per cent of meat was consumed at home against 40 per cent in wealthier households. Interestingly, the share of eggs was similar at about 60 per cent of production. The households typically reserved the eggs for the children.

In addition, rearing this hardy bird encouraged the women to become more market-oriented and entrepreneurial in their attitudes. Women used the increase in income to pay for children's education expenses, medical emergencies and to overcome food shortages. Because Kuroiler households became more market-oriented, the cash component of overall production value varied between 60 and 75 per cent as compared to 20 to 35 per cent for the households keeping indigenous birds.



World Society for the Protection of Animals

Poultry production was found to contribute about 10 per cent of income for Kuroiler-keeping households but many owners agreed that even though the income was not very high, the costs incurred were low and keeping poultry fitted well with their resource base and around the women's daily routine.

The Kuroiler supply chain also created business opportunities for owners of mother units and mobile vendors, who are able to derive a stable source of income from the sale of the Kuroiler. The average monthly scale of operation of mother units was 1,500 chicks, sold between the ages of 15 and 30 days. Before taking up the occupation, the owners of the mother units were either unemployed or worked as agricultural labourers or construction workers. Gross margins varied between Rs.10,000 and 20,000 with net income per month between Rs.3,800 and 5,300. The scale of operation of pheriwallas was between 1,000 and 2,000 chicks a month. Gross margins varied from Rs.2,000 to 10,000, with net income per month ranging between Rs.1,100 to 9,300.



Laying hens are kept in open, well-ventilated barns, provided with rice husk bedding and perches. The housing density is over 2 sq ft per hen.

Egg production

In addition to the rural poultry business, Keggfarms also produces eggs –branded 'Keggs' – aimed mainly at the urban consumer. The current level of production is 15,000 eggs per day and the planned annual production for 2011 is estimated at 6.8 million.

Commercial egg production in India is dominated by a relatively small number of large producers using high yield breeds and industrial methods of production. The vast majority of eggs in India are produced by hens that spend their lives in cages. The space allowance is typically 300–400 sq cm per hen (equivalent to an A4 sheet of paper), in which they cannot express natural behaviour. The preventive use of antibiotics in chicken and laying hens is not regulated in India and is widespread, with potential costs to human health. Eggs are largely a commodity item in India and production is driven by low cost parameters.

However, there is a growing appetite among Indians for alternatives that are kinder to animals and safer for the consumer, and this is where Keggfarms saw a market opportunity for their product.

'Keggs' are entirely produced at small-scale farms in and around Delhi and Gurgaon, in 'deep litter' systems where laying hens are kept on a single level of litter consisting of rice husk. The single tier barns are open, well ventilated and shaded by trees. The housing density is over 2 sq ft per hen (up to five times more room than caged hens). Perches are provided in the hen houses and there is a provision for outdoor access. The Keystone Golden breed of laying hen was created by Keggfarms. It is a hardy bird, larger than commercial layers and well suited to Indian conditions. It lays around 290 eggs in one laying cycle.

The feed is prepared in a mill and raw materials are obtained from wholesalers; there is also no preventive use of antibiotics. The addition of natural greens and maize provides the rich yellow colour to the egg yolk that makes it a favourite among consumers.

Keggs are sold directly to retailers at almost twice the price of commodity eggs. They can be found at individual shops, retail chains and also some hotels in the National Capital Region, and are being introduced to other metropolitan areas and larger towns. There are indications that the demand far exceeds the current supply. Keggfarms has 57,000 laying hens but has plans to cover more areas across the country and is gearing up to expand production facilities.

Conclusions

This market-oriented backyard poultry model:

- improves the livelihoods and food and nutrition security of poor households
- promotes gender equality
- is less reliant on external feed concentrates, with birds scavenging for food and feeding on household and agriculture by-products
- protects animal welfare
- provides a template for commercial egg production for the urban market that is kinder for the laying hens and safer for consumers.

1. Food and Agriculture Organisation (2006) *Livestock's Long Shadow: environmental issues and options*. Rome: FAO.
2. Food and Agriculture Organization (2009) *The State of Food and Agriculture: Livestock in the balance*. Rome: FAO.
3. In 1991 the Indian government embarked on an economic reform program that included industrial and trade policy and financial sector reforms as well as privatization which resulted in reduced trade barriers and removed investment restrictions across industries.
4. Landes, M., Persaud, S., and Dyck, J. (2004) *India's Poultry Sector: Development and Prospects*, USDA, Agriculture and Trade Report No. (WRS04-03), 67pp.
5. <http://www.businessworld.in/index.php/The-Chicken-Came-First.html>
6. Ahuja, V., Dhawan, M., Punjabi, M., and Maarse, L. (2008) *Poultry based livelihoods of rural poor: Case of Kuroiler in West Bengal*, Document 012, Delhi, India.