

Improving egg management

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There has been relatively little research in India on “village chickens”; on local practices, constraints and affordable technological improvements suited to small-scale chicken keeping. A research project, managed by the Scottish Agricultural College and with socio-economic inputs from the Natural Resources Institute and fieldwork by BAIF Development Research Foundation, has been making a modest contribution to filling the research gap.

The project, which began in late 2000, has been investigating the production problems facing poultry keepers in Udaipur district, Rajasthan and in Trichy district of Tamil Nadu, two semi-arid locations in rural India, and has been working with poultry-keepers to address some of them. A baseline survey identified serious problems with hatchability and mortality rates. In both districts egg spoilage was the single most important loss factor, followed by predation and disease, respectively.

In the three Udaipur project villages 25 - 30 percent of the eggs laid failed to produce chicks, while in the Trichy village the figure was just below 20 percent. This could be due to: the eggs not being fertilized; the embryo dying during embryo development; or the egg being contaminated with bacteria. In principle, eggs that are sterile, or in which the embryo has died before the egg is incubated, can be consumed or sold. But villagers were unable to distinguish them from fertilized eggs, so they would incubate all the eggs, thereby losing the opportunity to sell or eat the infertile eggs that were not going to hatch.

A method for improving egg utilization

Candling, the shining of a bright light through the shell, allows the stage of embryo development to be estimated, and thereby enables eggs that will not produce a viable embryo to be removed early on in the incubation period (4 - 7 days), and consumed or sold. Candling is widely used in the poultry industry, but the concept was new to the villagers. The only equipment that is essential to candle eggs is a good light source and a darkened area in which the eggs can be assessed. The project developed and tested a cheap battery-operated candling technology that was made from locally available materials (torch and metal box). Training in identifying infertile and fertile eggs using this technology was provided to four young males from poultry-keeping families in Udaipur in 2002 - 2003. A small trial was set up to check whether the trained farmers were able to distinguish between fertile and infertile eggs and this proved to be the case.

Improving hatchability of fertile eggs in the hot season

During the summer months (March - June) temperatures in Udaipur can reach more than 40 °C and poultry-keepers reported that during this period the percentage of spoiled eggs increased. It is well known that temperatures above 27 °C can increase embryo mortality rates, making it plausible that high temperatures are the cause of poor hatchability. The project team therefore tested another simple technology based on locally available materials that had the potential to reduce and stabilize the temperature of the eggs.

The technology involves the use of a half-moon shaped bowl, in which the eggs are kept cool by evaporative cooling. The bowl is filled with an earth/sand mixture that is kept moistened with water. A piece of jute bag is placed on the sand to prevent the eggs coming into direct contact with water. The eggs are placed

on the bag and a cotton cloth or woven basket is placed over them. The bowl is placed either on a shelf or ledge or on the floor, inside a family building. When the hen stops laying, all the eggs are placed under her, as per existing traditional practice.

With the help of two groups of poultry keepers trials were carried out in 2003 and 2004, comparing a treatment using the cooled egg storage technology with a control group applying normal storage conditions. The percentages of fertile eggs that hatched viable chicks were about 69 percent for the control groups in both trials, compared with at least 84 percent in the treatment groups. The results provide clear evidence that the modified storage of eggs did improve the overall hatchability of the eggs.

The cooling technology underwent gradual adjustments. During the first trial clay pots were used but these had a tendency to crack, so it was decided to use locally available iron pots in the second trial. Although the latter proved to be effective, reed baskets lined with cloth have been used more recently. These baskets are cheaper and they have the advantage that evaporation may also occur through the side of the basket, leading to greater cooling.

Increasing outreach and awareness

Villagers recognize the value of candling, and one of the trained youths has set up a candling service for people in his village and neighbouring villages. However, the project's aim is to promote candling by each individual family, and a large-scale promotion programme is currently going on.

Candling of eggs is relevant in any poultry-keeping system in any country. The egg cooling technology is relevant in countries or locations that experience temperatures above about 30 °C at certain times of the year. Both technologies may need to be modified in accordance with locally available materials and circumstances.

The project has now entered its final phase, in which the focus is on dissemination of information about these two egg technologies and about prevention of mortality by predators, for example, by placing thorny branches in the yard for chicks to run under for protection if they are threatened by crows. Posters on these subjects are being distributed to 300 - 400 villages in four districts of south Rajasthan, and the BAIF staff responsible for livestock development in these villages are being trained in the use of the technologies so that they in turn can train the villagers. Similar activities are also being undertaken by two new NGO partners Seva Mandir and Livestock Improvement Federation (LIFE). In addition, the use of Farmer Poultry Schools (based on the Farmer Field School approach) is being piloted and evaluated in 4 villages of south Rajasthan and 2 in Tamil Nadu, working with existing women's self-help groups. Finally, the project is seeking to raise the awareness of senior government policy-makers and politicians in Rajasthan and Tamil Nadu of the importance of backyard poultry as a livelihood activity of the rural poor, and of the potential for enhancing its contribution to livelihoods.

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