

# *Low-Cost Handmade Incubation Technology for Successful Poultry Chick Production*

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## ABSTRACT

A low-cost handmade incubation chamber was developed and successfully used for hatching poultry eggs at Krishi Vigyan Kendra Kotwa, Azamgarh-I. The unit, prepared using a thermocol box fitted with a bulb, fan and automatic temperature control system, maintained suitable conditions for incubation with minimal electricity consumption (1–2 units per day). A total of 40 eggs (20 Kadaknath and 20 Rhode Island Red) were incubated, resulting in more than 80–90 per cent hatchability. The chicks obtained were healthy and active, indicating the effectiveness of the system. This simple and affordable technology can be easily adopted by farmers for small-scale chick production, reducing dependency on hatcheries and improving rural livelihoods.

## INTRODUCTION

### Background / Problem

In Azamgarh district of Uttar Pradesh, backyard poultry farming is widely practiced by small and marginal farmers as a reliable source of supplementary income and nutritional security. Desi and improved

poultry birds are commonly reared under traditional systems, which play an important role in supporting rural livelihoods. However, one of the major constraints faced by farmers is the limited availability of quality chicks at the village level.

Most farmers depend on natural brooding by hens for hatching eggs, which is a slow and seasonal process. A single hen can hatch only a limited number of eggs at a time and the success rate often varies due to climatic conditions and poor management practices. In addition, the high cost of commercial incubators and the absence of nearby hatchery facilities make it difficult for farmers to adopt scientific methods of chick production.

Due to these limitations, farmers are unable to expand their poultry units or adopt improved breeds on a larger scale, which ultimately affects their income potential. Considering these challenges, there is a clear need for a low-cost, simple and easily adoptable incubation technology that can be managed at the farmer level under rural conditions.

### Intervention / Innovation

To address the problem of limited availability of quality chicks, an innovative effort was undertaken at the Krishi Vigyan Kendra Kotwa, Azamgarh-I by Dr. Vijay Kumar Vimal, Subject Matter Specialist, to develop and demonstrate a low-cost handmade poultry egg incubation chamber using locally available materials.

The incubation chamber was designed to maintain the essential conditions required for successful hatching, particularly temperature and humidity. Care was taken to ensure proper insulation, ventilation and uniform heat distribution within the chamber so that it could function effectively under field conditions. The design was kept simple and cost-effective to make it easily adoptable by farmers.

Fertilized eggs of different poultry breed viz., Kadaknath and Rhode Island Red were collected and placed inside the chamber. The incubation process was carried out by maintaining the temperature around 37–38°C and relative humidity between 60–70 percent. Eggs were turned (twice a day) manually at

regular intervals to support proper embryonic development.

The system was monitored regularly and necessary adjustments were made to maintain suitable internal conditions. This demonstration helped in assessing the practical utility of the handmade incubator and its suitability for use at the farmer level.

### Process / Methodology

A simple and cost-effective incubation chamber was developed using a thermocol box, which provided adequate insulation and helped maintain stable internal conditions (Fig.1&2). The chamber was fitted with a 100-watt electric bulb as a heat source and a small fan to ensure uniform distribution of heat and proper air circulation throughout the unit. An automatic temperature control device was installed to regulate the temperature and prevent overheating, thereby maintaining suitable conditions for incubation. The size of the chamber was kept appropriate to accommodate up to 20 eggs at a time, making it suitable for small-scale use at the farmer level.



Fig: 1 Handmade incubation chamber

Auto cut temperature

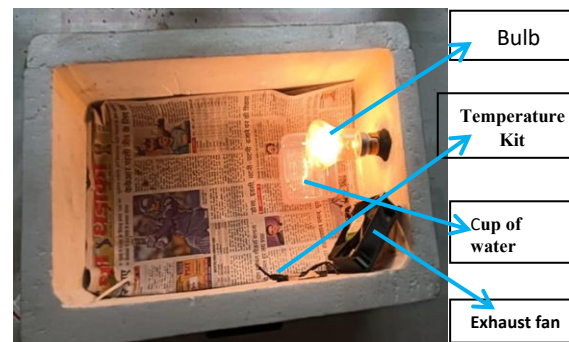


Fig:2 Various parts of hand made incubation chamber

Healthy and fertilized eggs of poultry were carefully selected and placed inside the chamber. Fertility was checked by observing the air space inside the egg when exposed to light (candling method). The temperature was maintained near the optimum range required for hatching with the help of the auto-cut system. To maintain proper humidity, a small cup of water was kept inside the chamber, which helped in creating a suitable moisture level for embryonic development (Fig.3). Adequate ventilation was ensured so that fresh air could circulate within the chamber without disturbing the internal temperature.



**Fig:3 Incubated egg and after egg hatching**

For proper growth and uniform development of the embryos, the eggs were turned manually twice a day at regular intervals. This practice helped in preventing the embryo from sticking to the shell and ensured better hatchability. The entire system was monitored regularly and necessary adjustments were made whenever required to maintain a stable environment inside the chamber.

The incubation setup required minimal electricity consumption, approximately 1–2 units per day, making it highly economical and suitable for rural conditions. The whole process was carried out carefully under field conditions, demonstrating that a simple, low-cost arrangement can effectively be used for hatching poultry eggs without relying on expensive equipment.

### Results / Outcome

The handmade incubation chamber was tested using eggs of two poultry breeds *viz.*, Kadaknath and Rhode Island Red (RIR), to

assess its performance under practical conditions. A total of 20 eggs from each breed were incubated in the chamber. After 21 days eggs were hatched out and chicks came from egg shell.

The system performed efficiently and hatching was achieved successfully in both breeds. The overall hatchability was found to be more than 80–90 per cent, which is quite encouraging considering the low-cost and simple design of the unit. The chicks obtained were healthy, active and showed normal growth, indicating that the incubation conditions maintained inside the chamber were suitable for proper embryonic development.

Regular monitoring, maintenance of temperature and humidity, along with manual turning of eggs twice daily, contributed significantly to achieving better hatchability. The results clearly demonstrate that this low-cost incubation system can be effectively used for small-scale chick production at the farmer level (Table.1).

**Table:1 Hatching performance of different poultry breeds**

Sl. No.	Poultry Breed	No. of Eggs Set	No. of Chicks Hatched	Hatchability (%)
1	Kadaknath	20	16–18	80–90%
2	Rhode Island Red	20	17–18	85–90%

### Impact

The successful use of this handmade incubation chamber showed that farmers can easily hatch chicks at their own level without depending on costly hatcheries. The system is low-cost, consumes very little electricity and is simple to manage, making it suitable for small and marginal farmers.

It has encouraged farmers and rural youth to adopt improved poultry breeds like Kadaknath and Rhode Island Red for better income. Overall, the technology supports self-reliance,

reduces costs and creates new opportunities for small-scale poultry farming at the village level.

### **Precautions**

- Always use healthy and fertile eggs for incubation. Fertility can be checked by observing the air space inside the egg when exposed to light (candling method).
- Handle eggs carefully and place them in proper position inside the chamber.
- Maintain proper temperature and humidity throughout the incubation period. Always keep a small cup of water inside the chamber to maintain required humidity.
- Ensure regular turning of eggs twice a day for proper embryo development.
- Maintain continuous electricity supply, as fluctuation or power failure may affect hatching.

- Avoid frequent opening of the chamber, as it may disturb internal conditions.
- Keep the chamber clean and well-ventilated to ensure healthy hatching.

### **CONCLUSION**

The successful hatching of poultry eggs using a low-cost handmade incubation chamber clearly demonstrates that a simple and affordable setup can be effectively used for chick production under rural conditions. Technology is easy to adopt, requires minimal investment and can be managed at the farmer level. It has good potential for promoting backyard poultry farming and improving income opportunities for small and marginal farmers.

### **REFERENCE**

Author's own compilation.