



E-ISSN: 2320-7078

P-ISSN: 2349-6800

JEZS 2016; 4(4): 702-704

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Received: 04-05-2016

Accepted: 05-06-2016

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Incubation and hatching chicken eggs by heat of 80-watt light bulb without any apparent side effect

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Abstract

Incubator is an electric device which is use to give a maintained temperature and humidity along with aerations to hatch eggs. Incubator act as broody hens which sits on the eggs and provide its body heat for chick hatching. An incubator was designed with the 80-watt light bulb. Bulb was used as heat source and was installed inside the box in such a way that it was connected with the Digital Temperature controller and to the AC adapter. Hence three of the devices i.e. Digital Temperature Controller, Light Bulb and CPU fan were interconnected as per manufacturer's protocol of Temperature Controller. Eggs started hatching on 21st day. All the eggs were hatched out except 2 eggs of Partridge which were unfertilised. Hence hatching results was found 100% in light bulb. Light bulb emits heat energy if this energy, is controlled it is more than enough to incubate the eggs. Light has no apparent side effect on chick development during incubation.

Keywords: Light bulb, eggs incubation

1. Introduction

Incubator is an electric device which is use to give a maintained temperature and humidity along with aeration to hatch eggs ^[1]. Incubator act as a broody hen which sits on the eggs and provide its body heat for chick hatching ^[2]. When a chicken or any other bird lay eggs, the life of an embryo remains adjourned till incubation start ^[3]. It takes about 21 days to hatch a chicken egg ^[4].

2. Materials and Methods

In an experiment an incubator was designed to investigate the ability of light bulb for hatching the chicken eggs. A plastic box was used along with few accessories mentioned below.

1. 80-watt Bulb with holder Fig. 2)
2. Thermo-Hygrometer (Fig. 3)
3. DC Exhaust Fan (CPU Fan) along with DC adapter
4. Digital Temperature Control (Fig. 4)
5. Wire gauze

2.1 Design and Description



Fig 1: Plastic Box with Temp. Controller

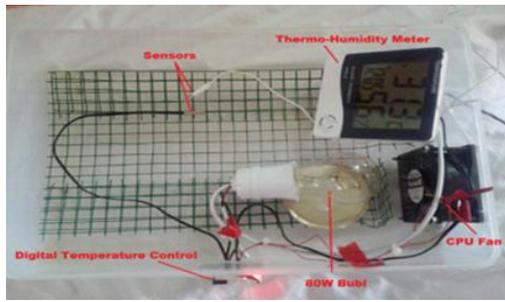


Fig 2: Accessories installed in Box

A plastic box was used to design the incubator (Fig.1). Wire gauze was placed in the bed of the plastic box. A rectangular hole was made at one wall of plastic box and CPU fan was installed in such a way that the flow of air is towards the inner side of the box. Digital temperature controller device was purchased from market and was installed outside the box as shown in the fig-2.

An 80-watt bulb was installed inside the box in such a way that it was connected with the Digital Temperature controller and to the AC adapter. Hence three of the devices i.e. Digital Temperature Controller, Light Bulb and CPU fan were interconnected as per manufacturer's protocol of Temperature Controller (Fig.4)



Fig 3: Thermo-Hygro meter

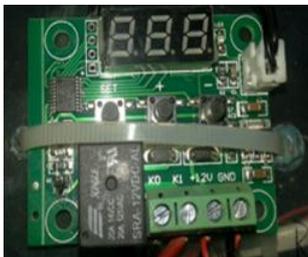


Fig 4: Digital Temp. Controller

2.2 Experiment

After connecting all the equipment, machine was turned on, placing 4 chicken eggs and 2 eggs of grey partridge. About 38-degree Celsius was maintained with help of temperature controller while water soaked cloths and later a vessel filled with water was placed inside the incubator to maintain the humidity (Fig. 4). Box was closed completely



Fig 4: Complete Setup

2.3 Mode of Action

By turning on the machine light bulb was turned on, heating the box. Whenever temperature reached to 38-degree Celsius, the sensor triggered the temperature controller to turn the bulb off. Hence the temperature of the box was maintained up to a certain limit. Humidity of the box was maintained by water filled vessel. Water was filled on daily basis to maintain the humidity between 60% to 90%. Eggs were rotated twice a day to ensure that all sides of the eggs are being incubated. This setup was monitored till 22 days.

3. Results

Eggs started hatching on 21st day. 1st black chick started making a small hole from inside the egg, later within an hour it was hatched completely. On 22nd day next chick was trying to come out of egg but it was stuck with the egg. So egg shell was peeled off by hands and was hatched. On the same day rest of the two chicken eggs were hatched. The two partridge eggs were analysed and were found unfertilized. Hence hatching results was found 100%.



Fig 5: Hatching Chicks

Chicks were completely healthy and were fed on chick-beginner feed available in the market. They were kept warm in a box containing a 20-Watt light bulb which provided them heat.



Fig 6: Chicks after one week of hatching





Fig 7: Chicks after one year of hatching

4. Conclusion

Light bulb emits heat energy if this energy, is controlled it is more than enough to incubate the eggs. Light has no apparent side effect on chick development during incubation; humidity is an important component which must be controlled for incubation process. Aeration is very important phenomenon in incubation as gasses are exchanged from egg to environment, aerations enhances oxygen flow into the incubator which is a vital gas for development of an embryo.

5. References

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