**International Journal of Allied Sciences (IJAS)**
Volume.13, Number 4; April-2022;
ISSN: 2836-3760 | Impact Factor: 6.15
https://zapjournals.com/Journals/index.php/Allied-Sciences
Published By: Zendo Academic Publishing

# COMPARING RETURN ON INVESTMENT IN CONVENTIONAL AND ENVIRONMENTAL CONTROL LAYER HOUSES

**[1]A.U. Qidwai**

**Article Info**

**Keywords:** Layer Farm, Environmental Control, Feasibility Analysis, Tropical Climate, Production Standards, Mortality.

**Abstract**

This prefeasibility study aimed to compare the expenditure and income differential of commercial layers reared in a conventional open-sided house and an environmental controlled (EC) housing system. Using equipment and standards from a reputed firm, a flock capacity of 40,000 birds with 6% extra chicks (42,400 chicks) was considered. The study showed that the investment cost per bird was higher in the EC housing system due to the installation of a tunnel ventilation system and control cabinet, but returns were significantly higher due to higher production standards and lower mortality. The study suggests that in tropical climate conditions, the EC housing system will be the future trend due to unpredictable climate changes. The document concludes by discussing the equipment costs, expected expenditure and returns, and the benefits of EC housing systems for layer farming.

## Introduction

Egg production systems have become subject to heightened levels of scrutiny. The housing system of laying hens determines their production performances. With the control of microenvironment in EC house, the birds show higher performances than in open house, though the cost of EC house construction and equipment are higher. At the same time, power failure backup systems should be in good working condition to regain the normal working of the control systems and other mechanical ventilation systems within the house. A prefeasibility study was conducted to compare the expenditure and income differential between commercial layers reared in a conventional open-sided house and an environmental controlled (EC) housing system. The study used equipment and standards from a reputed firm and considered a flock capacity of 40,000 birds with 6% extra chicks, making the total number of birds obtained 42,400 chicks. The prefeasibility study was conducted to ascertain expected expenditure and returns in both the housing systems, and the feasibility of the farm was analyzed. The study concluded by discussing the equipment costs, expected expenditure and returns, and the benefits of EC housing systems for layer farming.

[1] College of Poultry Production and Management Tamilnadu Veterinary and Animal Sciences University.

## MATERIALS AND METHODS

A prefeasibility study to ascertain the expenditure and income differential from commercial layers reared on conventional open sided house and environmental controlled housing system is carried out with using the equipments and standards from reputed firm.

A Controlled house is one in which inside conditions are maintained as near as to the bird's optimum requirement. A Closed Building, Longitudinally Preferably East to West, with Big Exhaust Fans on West side while Evaporative Cooling Pads on East side along with Automatic Feeding and Drinking Systems Inside.

A flock capacity of 40,000 birds with 6% extra chicks will be obtained making the total number of birds obtained is 42,400 chicks. The expected expenditure and expected returns in both the housing system were compared and feasibility of the farm were analysed.

**Table 1:** Technical details of open sided house

| | STARTER HOUSE | LAYER |
|---|---|---|
| House length (in meters) | 74.12 | 124.77 |
| width (in meters) | 16.80 | 11.02 |
| Total Area in Sq. mtrs | 1245.22 | 1374.9654 |
| Total Area in Sq. ft | 13398.52 | 14794.6277 |
| Approx. Civil Cost per Sq. ft | 200 | 200 |
| Total Civil cost/House | 26.79 lakhs | 29.59 lakhs |
| **Approx. Civil Cost per Bird/INR** | **63.20** | **72.69** |

**Table 2:** Technical details of environmental controlled house

| | STARTER | LAYER |
|---|---|---|
| House length (in meters) | 89 | 101 |
| Width (in meters) | 9.9 | 9.42 |

Comparative Prefeasibility Analysis for Large Scale Layer Farm

| | | |
|---|---|---|
| Total Area in Sq.mtrs | 881.1 | 951.42 |
| Total Area in Sq.ft | 9480.636 | 10237.2792 |
| Approx. Civil Cost per Sft | 250 | 250 |
| Total Civil cost/House | 23.70 Lakhs | 25.59 Lakhs |
| **Approx. Civil Cost per Bird/INR** | **55.89** | **62.88** |

## RESULTS

The results obtained from prefeasibility study to ascertain the expenditure and income differential from commercial layers reared on conventional open sided house and environmental controlled housing system is summarized below:

### Expenditure statement

The comparative analysis on the expenses involved in open sided starter and layer house is summarized in table 3 and 4 respectively.

**Table 3:** Expenditure statement for open sided and environmental controlled STARTER house

| Equipment | Open house | EC house |
|---|---|---|
| Univent Starter UV-S680 | 104.279,46 | 88.997,40 |
| Lighting | 9.755,14 | 9.366,33 |
| Feed storage | 4.529,30 | 4.108,25 |
| Feed supply | 1.142,10 | 4.680,76 |
| Combi Tunnel ventilation | - | 40.940,21 |
| Feeding Control | 5.776,56 | - |
| Heating – JetMaster | 7.677,96 | 8.716,72 |
| Fresh air curtains | 5.027,34 | 6.916,24 |
| Main Control | - | 9.428,40 |
| Manure removal | 8.857,25 | 7.583,71 |
| Climax Fans | 4.557,02 | - |
| Service | 15.500,00 | 19.450,00 |
| total cost | 167.102,13 | 200.188,02 |
| Exchange rate INR | 72 | 72 |
| **Total equipment cost (Starter)** | **120.31 Lakhs** | **144.14 Lakhs** |

**Table 4:** Expenditure statement for open sided and environmental controlled LAYER house

| | Open house | EC house |
|---|---|---|
| Univent UV600 | 99.958,68 | 102.114,25 |
| Lighting | 10.829,57 | 6.054,72 |
| egg collection - EC (EggCellent) | 11.270,34 | 14.091,18 |
| Egg collection | - | 1.450,80 |
| Feed storage | 4.613,06 | 3.969,50 |
| Feed supply | 4.849,26 | 4.588,09 |
| Tunnel ventilation | - | 21.969,12 |
| Fresh air curtains | 6.824,20 | 7.584,08 |
| Manure removal | 7.943,70 | 7.450,32 |
| Control Cabinet | - | 9.805,54 |
| Egg cross collection | 28.185,34 | 14.900,00 |
| Climax Fans | 5.486,83 | - |
| Fresh air curtains | - | - |
| Feeding Control | 4.332,42 | - |
| Service | 15.900,00 | 14.900,00 |
| total cost | 200.193,40 | 193.977,6 |
| exchange rate INR | 72 | 72 |
| **Total equipment cost (layer)** | **144.14 Lakhs** | **139.66 Lakhs** |
| **Equipment cost for starter & layer** | **264.45 Lakhs** | **283.79 Lakhs** |
| **Equipment cost / bird (Starter + Layer house)** | **623.71 lakhs** | **669.31 Lakhs** |

Briefly the cost of equipments for starter house for rearing 40000 birds was 120.31 lakhs and 144.14 lakhs with respect to open and EC house whereas the cost in a layer house was 144.14 lakhs and 139.66 lakhs. Altogether the cost was 264.45 and 283.79 lakhs for open sided and EC house respectively. The equipment cost per bird was

623.71 lakhs and 669.31 lakhs respectively. The higher cost involved was mainly due to ventilation control provided in EC house.

**4.2. Returns statement**

The comparative analysis on the returns from open sided starter and layer house is summarized in table 5 and 6 respectively.

Briefly, the mortality inside EC housing system was lower by 2% which in turn results in higher production and sale thereby higher returns. The average income expected form open sided and EC house will be approximately 405.14 and 431.59 Lakhs respectively.

**Table 5:** Income statement for open sided and environmental controlled **LAYER** house

| | Open house | EC house |
|---|---|---|
| Mortality in layer House | 6% | 4% |
| no of birds mortalized | 2442 | 1628 |
| Total No. of Birds after Mortality | 38862 | 39076 |
| Average feed price/kg | 18 | 18 |
| Average feed intake/bird/day (gms) | 110 | 108 |
| Average egg price | 3.1 | 3.1 |
| Average power cost /KWH | 7 | 7 |
| Market Cull Bird/Price | 128 | 128 |
| Interest Rate | 12% | 12% |
| Feed Cost/Egg | 1.98 | 1.9 |
| Birds Uniformity | 70 - 75 % | 85 - 90 % |
| Total eggs produced per bird | 295 | 315 |
| Total eggs produced per flock | 11464290 | 12308940 |
| **Revenue generated from eggs** | **355.39 lakhs** | **381.58 lakhs** |
| **Sale of spent hen** | **49. 74 lakhs** | **50.02 lakhs** |
| **Income** | **405.14 lakhs** | **431.59 Lakhs** |

**Table 6:** Statement showing the savings under environmental controlled housing system

| | | |
|---|---|---|
| Difference in Mortality | 814 | birds |
| Total eggs produced from Mortality Difference | 256410 | Eggs |
| Revenue generated from eggs | 794871 | INR |
| Revenue generated on mortality (at Culling) | 104192 | INR |
| **Total revenue generated from Mortality (Difference)** | **899063** | **INR** |
| Feed saving per day | 0.0848 | Tonnes |
| Feed saving in a flock (72 weeks) | 42.7392 | Tonnes |
| AVG Cost of Feed/ton | 18000 | INR |
| **Total Saving on feed / flock** | 769305.6 | INR |
| EC house total income | 44058505 | INR |

**DISCUSSION**

The equipment cost per bird for open house is Rs. 623.70 whereas for EC house it is Rs. 669.33. Cost in EC house is higher than open house due to the installation of tunnel ventilation system and control cabinet in EC house. Total number of eggs produced per flock in EC house is 1,23,08,940 eggs and in open house is 1,14,64,290 eggs. Therefore about 8,44,650 extra eggs will be produced from the EC house reared hens with same capacity. **This is**

**due to 2% lower mortality in EC house**. And so the sale of spent hen is also generates higher revenue in EC house. The higher investment due to ventilation control inside open sided house will be compensated within 2 production cycles due to higher returns.

## VI. CONCLUSION

The investment cost per bird though higher in EC housing system the returns are significantly higher on a long run due to higher standards of production and lower mortality. Also, in tropical climatic conditions EC will be future trend in due to unpredictable climatic changes.

## REFERENCES

Sind Board of Investment, Pakistan Poultry Association.

Brian D. Fairchild, Extension Poultry Scientist, Department of Poultry Science [3] Layer farming, Department of Animal Husbandry, Livestock, Fisheries & Veterinary Sciences, Government of Sikkim.

Housing poultry, By Dr. A.U. Qidwai, B.Sc, BVSc & A.H., M.V.Sc.(poul.Sc.), Ex.

Joint Director Poultry, Animal husbandry Dept. U.P.

http://www.poultryventilation.com/

http://www.dynamicautomation.co.za/Ventilation.htm