

Fabrication of Feeder to Feed Chickens in Small Scale Poultry Farms

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Abstract: The growing need for poultry products by consumers has urged the necessity for small and medium scale poultry farmers to meet up the demand since they supply the bulk need of the market especially in the developing countries. There exist the need to produce birds that will meet the market standards within the shortest time without straining the farmer's time, resources and energy. In this project work an effort made to develop a new feeder to poultry farms. In small scale and medium scale poultries birds are fed with the feeder which requires two feeders for refilling of food, this consumes more labour, maintenance and time increasing expenditure for farmers. With a view to facilitate easy and efficient feeders to chickens in small and medium scale poultries, it was proposed to design and fabricate a new feeder to poultry farm.

Keywords: Poultry Farms, Feeder, Chicken.

1. INTRODUCTION

Poultry farming is that the raising of domesticated birds like chickens, ducks, turkeys and geese for the aim of farming meat or eggs for food. Quite fifty billion chickens are raised annually as a supply of food, for each of their meat and their eggs. Poultry farming has become a remunerative business and pre-eminence over all other livestock enterprises in the developing countries. It carries a scope for quick and large profit. In recent years, backyard poultry production has been extremely emphasized in sustaining and enhancing rural livelihoods. In this farming, birds are kept in low-input and low-output system and can easily be managed by women and children of the households. Nowadays as there is growing concern about meeting of per capita requirement of protein for rural citizens of India, poultry meat and especially eggs have been proved to be the best and cheapest. Though India has shown a tremendous growth in poultry production over decades. Livestock plays an important role in the Indian economy. About 20.5 million people depend upon livestock for their livelihood. Livestock contributed 16% to the income of small farm households as against an average of 14% for all rural households. Livestock provides a livelihood to two-third of the rural community. It also provides employment to about 8.8 % of the population in India. India has vast livestock resources. The livestock sector contributes 4.11% GDP and 25.6% of total Agriculture GDP.

Feeders are equipment used in feeding poultry birds as shown in figure 1. The food is deposited in the feeder and the birds feed from it. The amount of feeders provided for a poultry farm should be according to amount of birds available. It is important that you always keep the feeders clean to ensure the health safety of the birds.



Figure1: Feeder

The feeder should keep neat and clean always to keep the chicken healthy. Keep sufficient numbers of feeder in the poultry house according to the number of the chickens. If the amount of feeders are less than the chickens then they can't consume enough food and their health will broke and if the feeder become more than the amount of chickens then the birds will waste the food and maximize your feeding cost. So, keep the amount of feeders according to the number of the chickens. Dirty. Since above mentioned containers were most of all positioned outdoors in runs, they filled with water when it rained resulting in swollen feed, so that not more desirable for animals and consequently creating considerable waste of it.

2. PROBLEM DEFINATION

At present breeders in rural areas those who are carrying contract poultries are using manually feeder equipment. The usage of manual feeders is of two different types, one type for chicks and the other one for chicken, basically these types of feeders cause double investment on using of two different feeders, for feeding both chicks and chicken. So as we round it as a drawback for which it causes increase in investment on buying separately on those feeding equipment's. The initial equipment that is used to feed the chicks is used only for short period of time and the equipment is further not used until the next batch arrives.

On implementing this in small-scale/medium-scale poultries especially in rural poultries for less flocks would increase in the investment only for just purchasing two different feeders and more man power is required or Labours are required in order to maintain the flow of the process.

3. METHODOLOGY

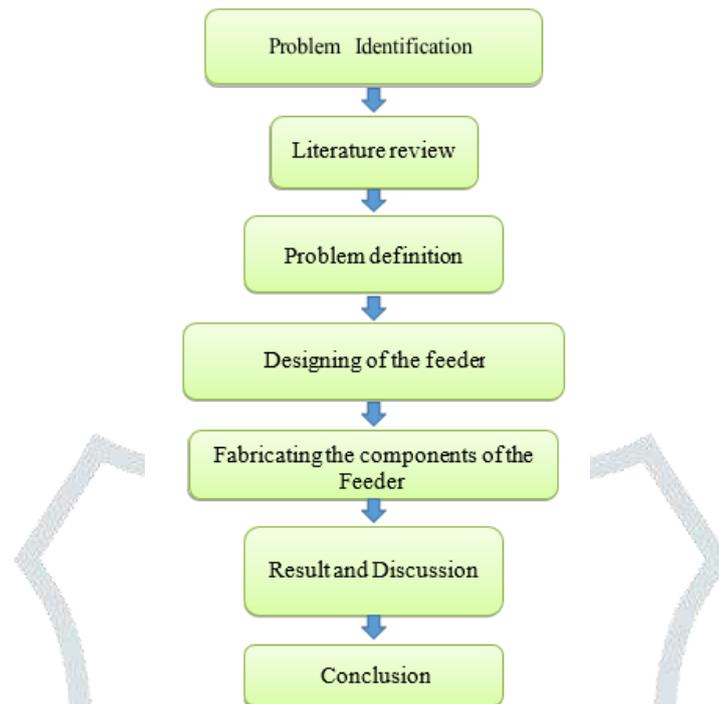


Figure 2: Methodology Flow Chart

4. COMPONENTS & SPECIFICATIONS

The components and specification used for the feeder are

- Body
- Extended body
- Base plate
- Connecting rod
- Cover

Table:1. Design specification

Components	Dimensions(mm)
Body	200x150
Extended body	200x150
Base plate	380x20
Connecting rod	550x40
Cover	150x60

5. COMPUTER AIDED MODEL.

CAD stands for Computer-Aided Design; with the help of computer aided design software we can create new design, modified it or may analysis it also. There are so many cad software are used in industries currently like pro-e, autodesk fusion 360, catia, solid works etc.CAD software are used to increase the productivity, improve the quality of design, improve communication between deign and requirement virtually. All model components are designed and assembled in the software autodesk fusion 360 student version as shown in figure 3.



Figure 3: Feeder

5. FINITE ELEMENT ANALYSIS RESULTS:

Generally we have three types of technique to solve any engineering problem, first one is Analytical method in which we reached to our solution through formulas and hand calculations, it is a classical approach , it is assumed to 100 % accurate , but this solution only applicable for simple problems . A second technique is numerical method; it is basically a mathematical presentation of a problem in which we use matrix to solve any engineering problem using CAE software, in this technique we does not need to make proto-type , it is a simple technique in which we design and analysis our product using computer system. Using this technique we can easily test our product, or make changes ac-cording to requirements, but the results cannot be believed blindly, we need to verify our results by other any techniques. A third one technique is physical experiments, in this technique we need to make a real product prototype and test it, if the test will goes failed need to design and modify, and again test is so we can see it was very long term process and very costly also, along with that, we needed an experienced workers for this work. So finally we solved our problem through numerical method, the numerical method basically based on discretization to convert our model from infinite to finite one, assume we have a geometry have infinite number of points, so if we want to analysis it , we have to solve infinite number of equations means we can't achieve the exact solution of our problem. So with the help of discretization, divide our model into countable number of nodes and elements, at the end we got final and exact answer of our equation.

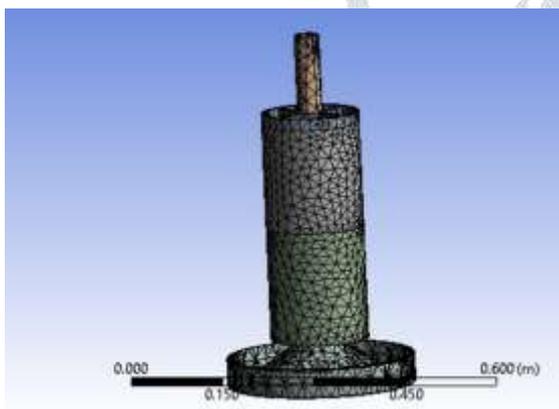


Figure 4: Meshing

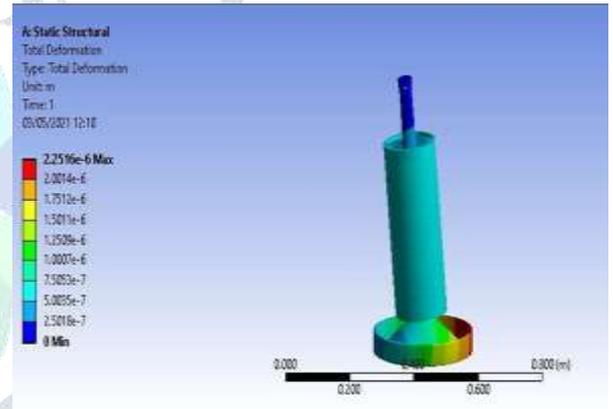


Figure 5: Deformation

This above figure 4 represents shows the mesh generated on the chicken feeder and shows number of nodes taken is 72334 and elements taken is 39338 while generating the mesh. The figure 5 shows the deformation produced after the addition of feed into the component and the total deformation obtained is 2.25×10^{-6}

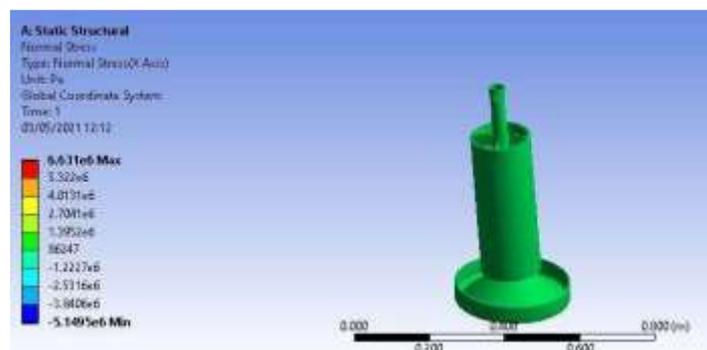


Figure 5: Stress distribution

The figure 5 shows the stress induced by the addition of feeder to the entire equipment, and stress that is produced can be observed, with maximum stress to be 6.631×10^6 and minimum stress to be 5.145×10^6

6. CONCLUSION

The identified problem is, that two different types of feeders are used at different stages in the current situation which increases cost and maintenance of equipment. Hence, instead of using two different equipment's we design the model in such a way that a single equipment could be used to feed both chick's and chicken at their respective growth cycle. Which would cut-down the expenses and maintenance of using two different feeders.

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