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Broiler Grow Out Report

In this poultry experiment, there will be data collected to measure the weight gain and FCR on birds that are in different environments as well as separated into male and female pens. There are three variables that we are looking at in this experiment. The first is a high stocking density with a high light intensity treatment. The second is a lower stocking density with a high light intensity. The last is a low stocking density with low light intensity.

The high stocking density room is separated into a male and female pen. The males will grow more efficiently than the females which means that their FCR numbers will be better. The light intensity will help the whole room grow more as well.

The second treatment is a lower stocking density with a high light intensity. The males will grow more efficiently than the females but these birds will not show the efficiency numbers that the first treatment will because the feed intake will not be as much which will cause the FCR numbers to be lower.

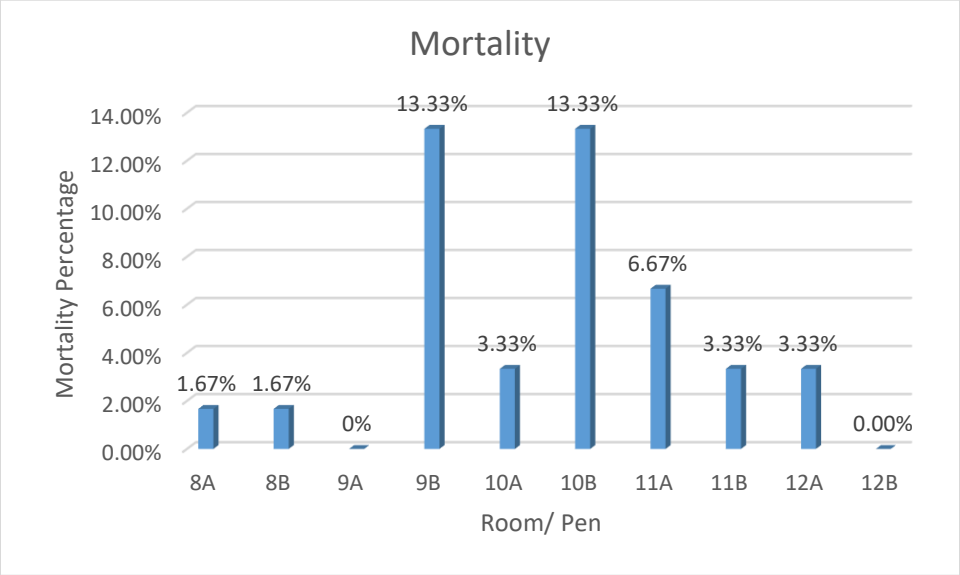
The last treatment is a low stocking density with a low light intensity. These birds will be the least efficient because they will not be as active as the other rooms. Because they are not as active, they will not consume as much feed and will not have as much of a water intake which will affect the FCR of the birds in this treatment.

There will be poor litter quality in the high stocking density rooms when compared to the other rooms which will cause a higher ammonia content and could cause breast blisters and/or hock burns.

Interpretation and Data:

The experiment was designed to measure the weight gain between broilers with different pen conditions. The data that we collected shows which birds were the most efficient. The first calculation to be made is mortality. Mortality is the percentage of how many birds died during the experiment.

Figure 1:



In figure 1, the mortality from each pen is shown. In the high stocking density pens, 8A and 8B, we have a low mortality rate of 1.67%. From this we can say that this treatment did not have a stocking density issue. From the dimensions of these pens, the room that had 60 birds per pen had 1 square foot per bird. One square foot is plenty of room for a 42-day old broiler; therefore, there was not an overstock problem. The rooms that had low stocking density and high intensity lighting, 9 and 10, gave a close comparison between the two. The males in these rooms had the highest mortality out of all the pens. One of the female pens in this treatment had a zero percent mortality while the other had 3.33% which was just a single bird. The low stocking rooms that had the low intensity light show results that are hard to make a comparison of between males and females. One male pen and one female pen that had the same mortality rate. The female pen, 11A, was the highest mortality rate in this treatment with 6.67%. Overall, the inference can be made that the males had an overall higher mortality rate than the females in this trial. The mortality rate of the trial was 4.44% which means that the birds did well.

The next calculation that we made was the uncorrected starter FCR (feed conversion ratio). FCR is that number that will show us how many kilograms of feed it will take to grow one kilogram of chicken. The uncorrected FCR will give us a number that does not factor in the mortality rates of the flock. It is simply based off the average weight gain. The starter FCR shows us this number based on the period from day 0 to day 14.

Figure 2:

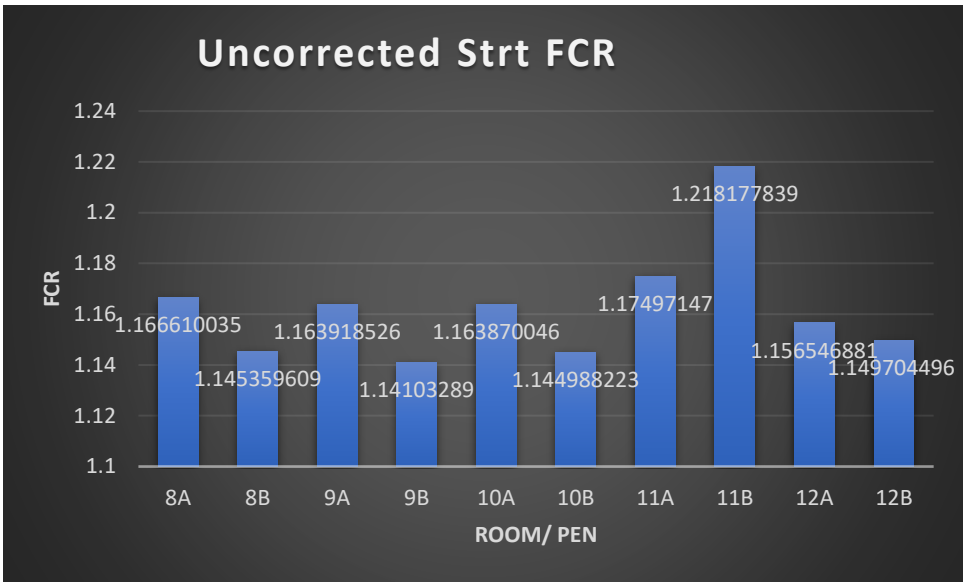
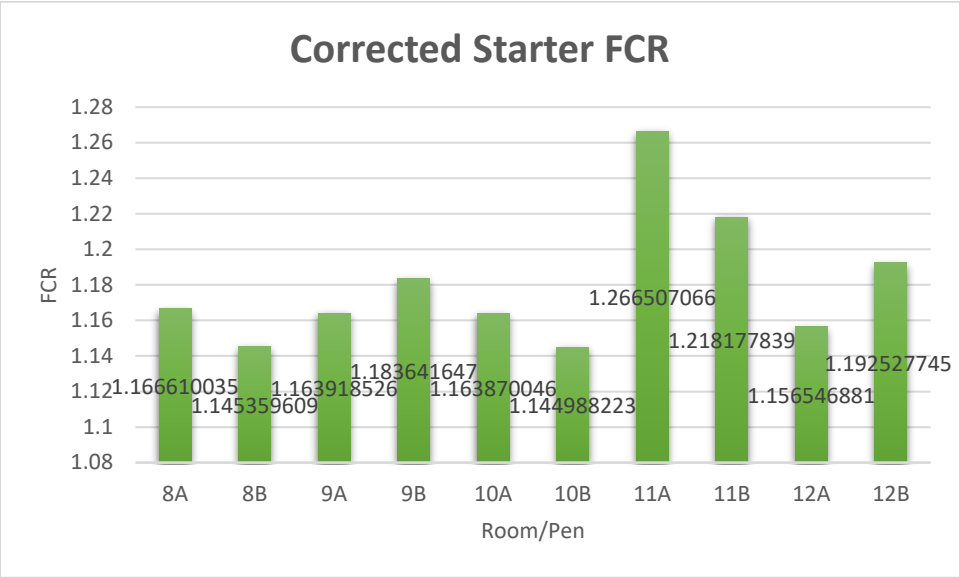


Figure 2 shows the uncorrected starter FCR. The starter period is the most important in the grow out process. From the figure, we can confer that the low density light treatment had a slightly higher FCR than the pens with the higher light intensity. The high stocking density pens show little difference between the other high light intensity rooms. Males gave us more efficient numbers in the high light intensity treatment. The only male pen that gave us higher FCR than the female pens is 11B which is in the low stocking density and low light intensity treatment. Overall, the males had a more efficient FCR than the females. The pens with high light intensity also had better FCR's. The stocking density did not prove to make a difference in the uncorrected starter FCR.

From the uncorrected starter FCR, we go to the corrected starter FCR. The corrected FCR is where we take into consideration the mortality of each pen. This will change the numbers some because not every bird weighed the same amount on day 14.

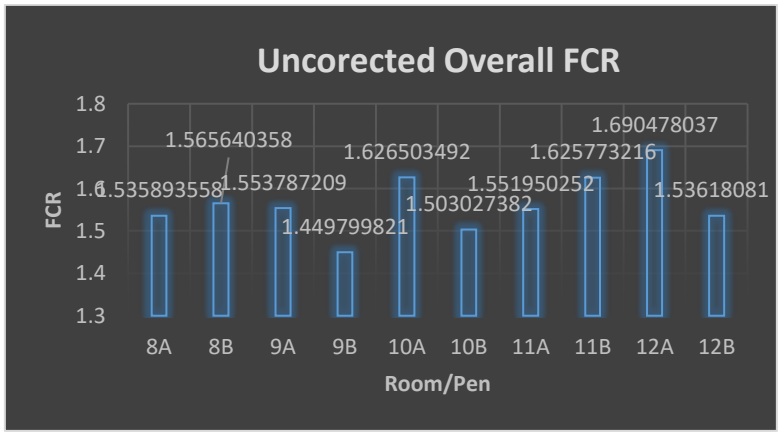
Figure 3:



As shown in figure 3, the FCR numbers for the starter period change slightly when we factor in the mortality. The pens that had the higher mortality rates changed the most between the mortality corrected and uncorrected FCR numbers. One thing that is shown is that the high light intensity treatment gives us better FCR numbers than the low light intensity treatment rooms. The stocking density shows us no major difference for the starter phase of the grow out. The males had more efficient numbers within the overall flock.

The overall grow out is from day 0 to day 42. The total feed intake is divided by the total weight gain to get the overall FCR.

Figure 4:

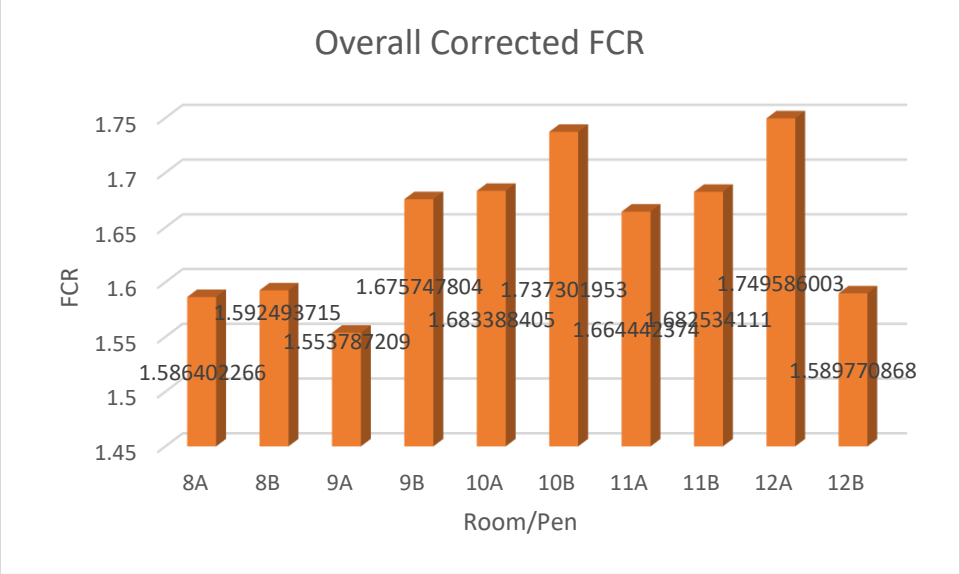


In figure 4, the difference in feed conversion ratios between treatments without factoring in mortality are shown. The high light intensity rooms gave better FCR numbers than the dim light rooms. The differences between the

male and female pens in the uncorrected FCR table are hard to point out because the results are skewed across the chart. Some male pens did better than the females that they shared a room with while other rooms were the opposite.

Then a comparison can be made about the difference between the corrected FCR with the previous uncorrected FCR numbers in figure 4.

Figure 5:



From the numbers in figure 5, we can gather that the better FCR numbers are on the higher light intensity rooms. This is the last FCR calculation that was made. Based off all the treatments, the higher light intensity causes a better FCR in most cases because the birds are not resting as much. The birds are active which makes them want to eat and drink more. When the flock was observed, the birds in rooms 8, 9, and 10, which was the high light intensity treatments, were much more active than the birds in rooms 11 and 12. The inference can be made that the birds in the higher stocking density room, 8, were more efficient as a room than the rest of the rooms. This could be because the feed intake is doubled which leads to more weight gain for some birds which will help the FCR numbers.

The last calculation that was made is hot carcass weight uniformity and breast weight uniformity. These specifications are important to the industry because processing plants must run constantly to be productive. To run

constant, the employees do not have time to change equipment to be able to accommodate different sized birds. The uniformity number should be as high as possible and the CV number should be as low as possible.

Figure 6:

Room/Pen	Hot Carcass Uniformity	Hot Carcass CV	Breast Wt Uniformity	Breast wt CV
8A	76%	9.14%	53%	13.70%
8B	70%	8.19%	48%	13.75%
9A	88%	6.48%	60%	12.70%
9B	75%	8.57%	50%	15.54%
10A	78%	7.42%	43%	13.85%
10B	76%	9.11%	48%	17.29%
11A	70%	8.91%	68%	12.91%
11B	56%	13.75%	33%	19.95%
12A	81%	6.74%	64%	12.01%
12B	89%	7.08%	68%	12.59%

As shown in figure 6, the hot carcass uniformities are in a wide range. There is one room that has a low uniformity and that is a low light intensity treatment. There are also pens in the low light intensity treatment that have high uniformities. There is no sign that tells why pen 11B is so much different than the others. In pen 9A, the uniformity is high. This is a pen that has a low stocking density and high light intensity treatment. The rest of the rooms were close in hot carcass uniformity. The CV numbers are inversely related to the uniformity percentages. These numbers should be as low as possible. The only CV number that is drastically different in 11B because the uniformity was so low.

The breast uniformities are low. There are several factors that could have affected the breast uniformity results. One would be that some were not able to be used because it was our chance to learn how to debone. There were some that were defective and others that were cut into different pieces that could not be accurately weighed. Another reason could be that not all the breast meat was collected from the carcass which would cause the weights to vary. It is hard to be precise with this calculation unless the same person debones each piece of meat. With everyone in class taking a turn, the results varied more than we would have liked.

Another concern that we observed in this experiment is the effect of stocking density on litter quality. The litter quality in room 8 which had twice as many birds as the other rooms was much worse than the lighter stocking density

rooms. The trial started on all new shavings which made it easy to tell the difference in the quality. The difference between this and what happens in the industry is that industry does not clean out the dirty litter very often which makes ammonia build up. Ammonia build up will cause carcass downgrading in the form of breast blisters and/or hock burns, which will cost the grower and the company money, in the end. During the starter period, there was not as much of an affect caused by ammonia than there would be on poultry grow out farms. Stocking density is an important aspect to the industry because we want to keep our flocks as healthy as possible but we also want to be able to grow as many birds as possible. The industry must find a happy medium to maximize profitability for both the grower and the integrated poultry firm.

From the results of this study, the most efficient birds that were grown had the treatment of high stocking density and high light intensity. The most efficient pen in the trial would be the males in room 8. This proved to be true because the birds were more active than the other treatments which caused them to have more feed and water intake. More feed and water intake caused there to be more weight gain throughout the grow out period. There was low mortality and good FCR numbers throughout the trial. The experiment was a great opportunity to learn about how poultry flocks grow in different environments as well as the process that takes place in the industry every day. Excel proved to be a useful tool to use once the learning curve was jumped. The experience of putting all the pieces together is what made the report interesting. There are many factors that go into research that are not often thought about. Learning about how different environments affect birds will only be useful in going forward.