

# Analysis of Growth Rates and Feed Efficiency for Broilers and Buckeyes



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## 1. ABSTRACT

The broiler chicken industry in the United States is the largest in the world. The Cornish Cross is the breed that is raised for the broiler industry. Broilers are the prime candidate for meat production because of their ability to wholly develop in an average of six weeks.

The heritage breed Buckeyes have a dual purpose of meat and egg production. The broiler chicken is extremely efficient, but they are often compared to heritage breeds by certain customers due to differences in taste. The objective of this study was to compare the rate of growth between broilers and buckeyes and process them when both were the same weight. It was hypothesized the buckeyes would grow at a slower rate than the broilers with less muscle mass.

After nineteen weeks, the buckeyes had not reached the same live weight as the broilers. Not only was the weight not achieved, it seemed less likely that the buckeyes would ever attain the weight as it was discovered that the average weekly average body weight gain began to diminish. The feed conversion ratio was also not as efficient for the Buckeyes. Future directions will be based on questions concerning whether outdoor availability affects growth rates or if enough selective breeding with buckeyes will be able to create birds as productive as broilers.

## 2. INTRODUCTION

When raising chickens, it is crucially important to have efficient inputs such as resources, money, and labor. Small flock owners must consider many different possibilities before production. When growing Broilers, the expected growth period before processing is six weeks. With the heritage breed Buckeye, months of caretaking are anticipated. Farmers have to also include costs for food, water, and shelter. The difference in taste for the two breeds comes from the difference in ages at which the birds are processed. The early age at which the Broilers are processed does not allow for a development of naturally occurring hormones that affect taste. Many customers say the Broiler chicken tastes bland. A Buckeye, when processed at an older age, has a specific taste that certain customers desire greatly.

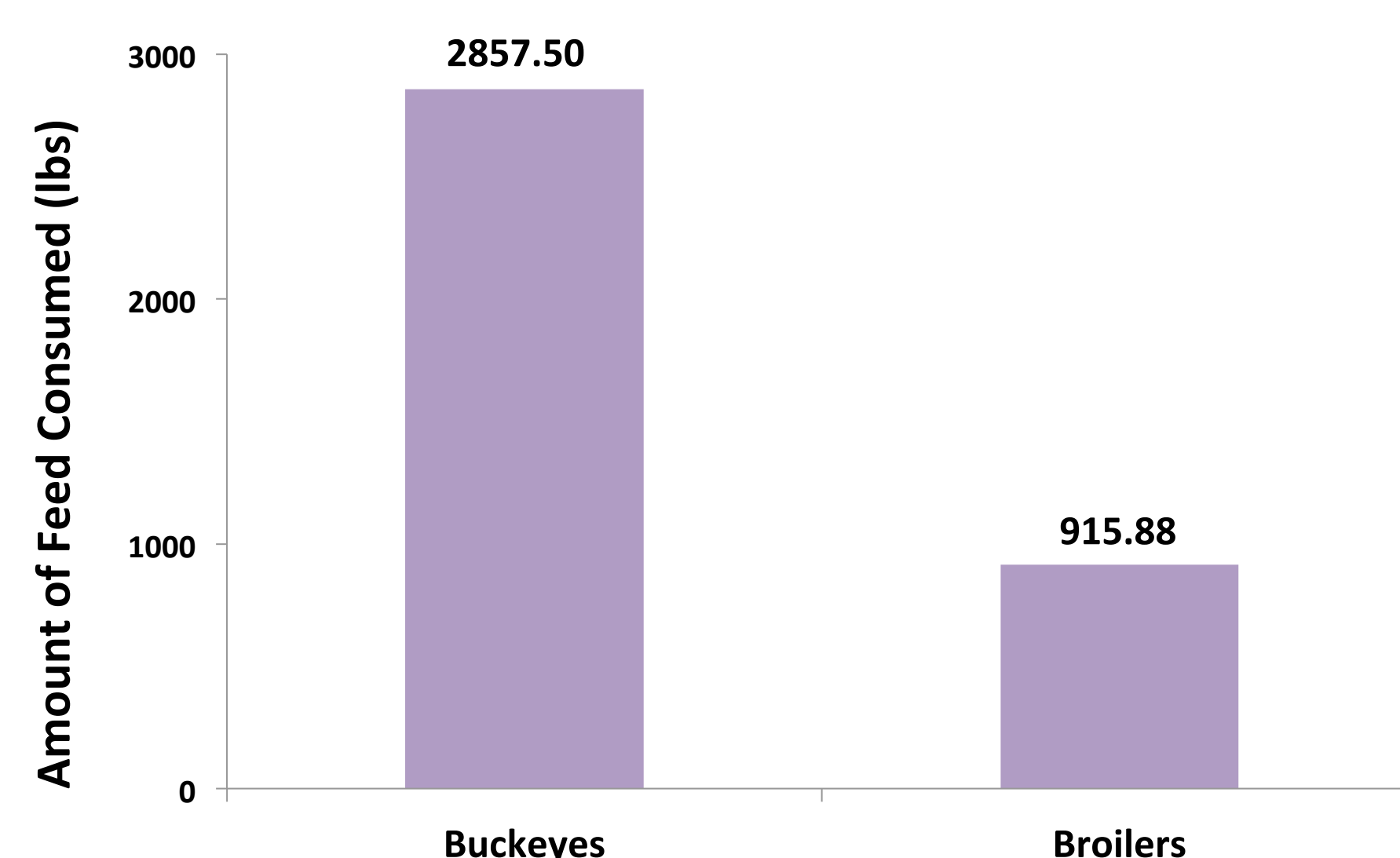


Figure 1. Cumulative Feed Consumption

## 3. OBJECTIVE

The Objective of this study was to compare the rate of growth and feed efficiency between the Broilers and Buckeyes in order to determine the ability of each.

## 4. MATERIALS AND METHODS

Birds were raised at the Delaware State University Hickory Hill Research Farm. Both breeds were received within the same week. Eight pens were utilized, four pens for each breed. On average each pen contained thirty chickens. After six weeks, the eight pens were converted into four in order to allow more space for the Buckeyes to mature. Weekly, the chickens were each weighed. The amount of feed and water consumed weekly was also calculated. Two contrasting types of feeders were used within the pens along with four dissimilar water buckets. A diet formulated for growing chickens, Kalmbach Feeds, was provided *ad libitum* as was water. The study design was based on work by McCrea et al., 2014.

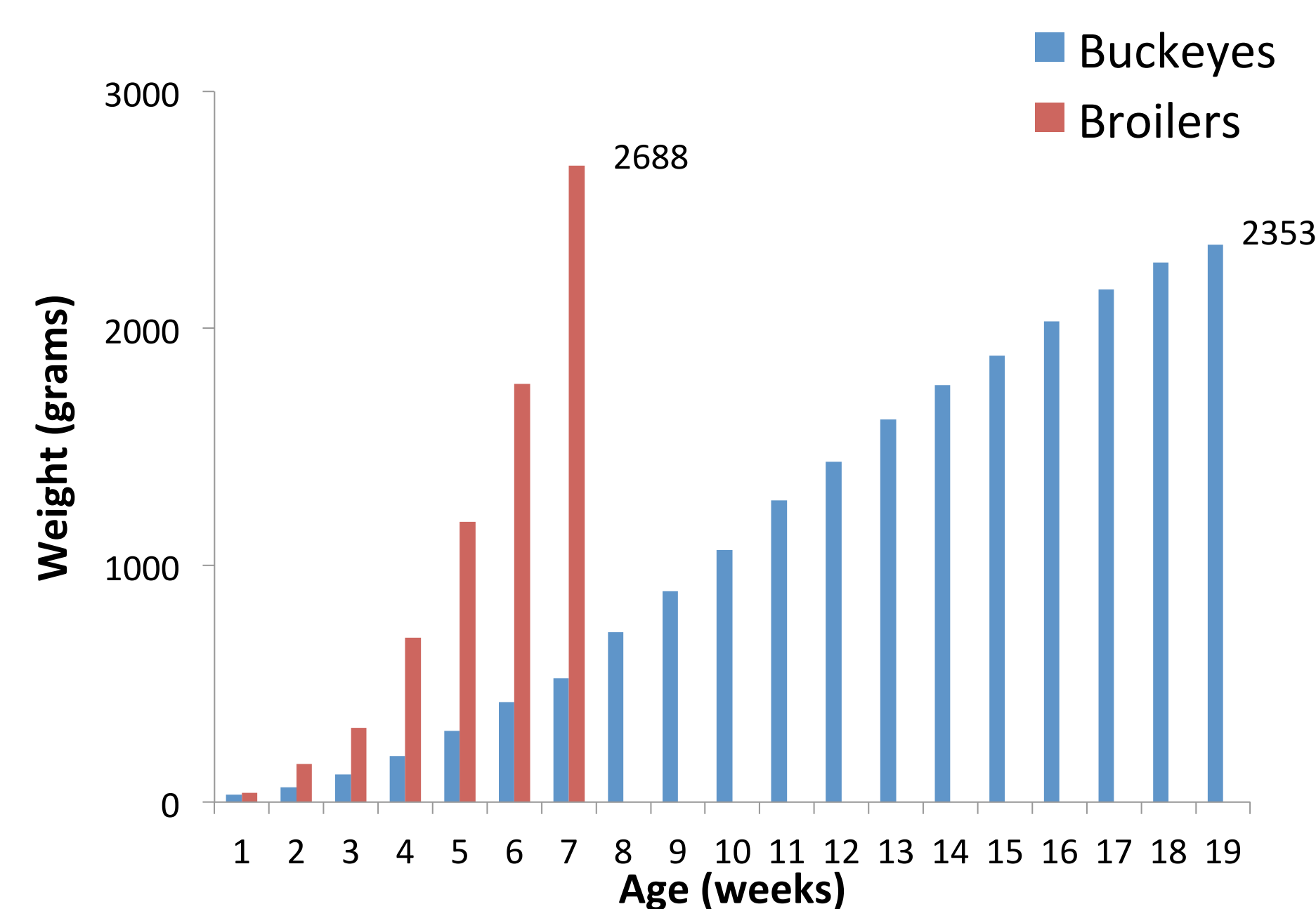


Figure 2. Average Weekly Live Body Weights

## 5. RESULTS

It took only six weeks for the broilers to reach an average weight of 2.688 kilograms (5.926 lbs). The buckeyes were processed after nineteen weeks. The average weight of the buckeyes, however, still was less than that of the broilers with merely 2.353 kilograms (5.187 lbs; Figure 2).

The food provided to the birds cost fourteen dollars for a fifty pound bag. With a cumulative weight of 415.43 kilograms (915.88 lbs), the entire cost to feed the broilers was approximately \$256.44. Altogether, the buckeyes consumed 1296 kilograms (2857.50 lbs), with a cost of roughly \$800.10. (Figure 1).

## 9. ACKNOWLEDGEMENTS

This study would not be possible without the Delaware State University CIBER program. Many thanks to Brigid McCrea for her expert knowledge in poultry sciences.

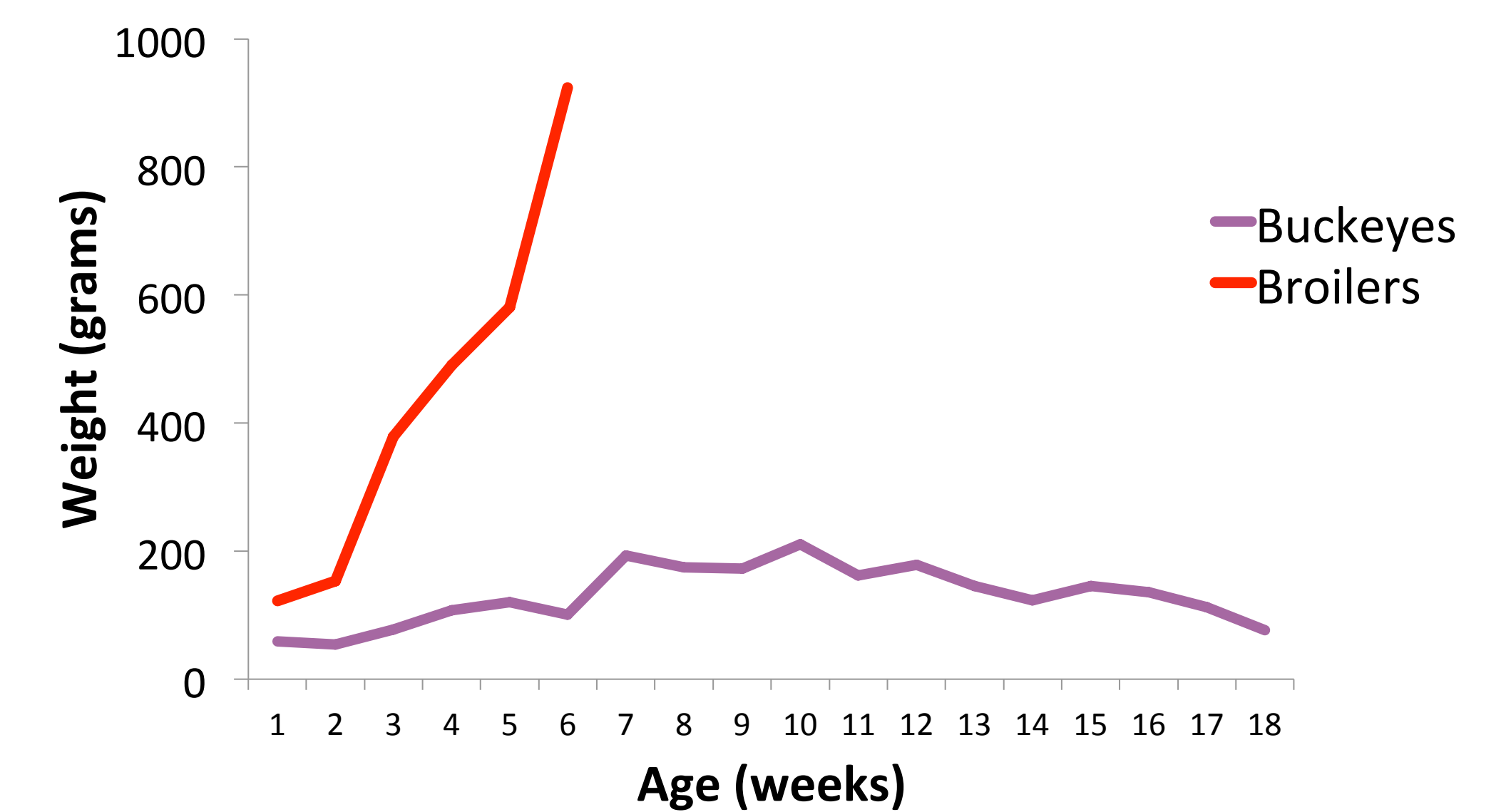


Figure 3. Average Weekly Body Weight Gain

## 6. DISCUSSION

The Buckeye was three times older than the Broilers when processed. Notably, the expense for feeding Buckeye was larger. It was also clear that though the average live weights of the two breeds were relatively the same, the Broilers yielded more meat than the Buckeye. The cost of feed for the Buckeye, similarly, was three times more than the Broilers. With this knowledge, farmers should know to price the Buckeye carcasses at least three times the price of the Broilers. When comparing the feed conversion ratio (the representation of the feed converted into meat) of the two breeds, the broilers are distinctly superior when gaining weight. (Figure 3).

## 7. FUTURE DIRECTIONS

- Outdoor availability is a touchy subject for many people. It is proven the birds will not even explore it to the full extent according to Fanatico et al., 2016. There lays a possibility that too much time spent outdoors could lead to a chicken putting its energy elsewhere than meat production.
- Further studies may experiment with selective breeding with the purpose of creating more adept heritage breeds. Results will show if broilers will one day be inferior to another breed

## 8. REFERENCES

- Fanatico A.C., J. A. Mench, G. S. Archer, Y. Liang, V. B. Brewer Gunsaulis, C. M. Owens, and A. M. Donoghue. 2016. Effect of outdoor structural enrichments on the performance, use of range area, and behavior of organic meat chickens. *Poultry Science*. 10.3382/ps/pew196
- McCrea B.A., A. F. Mills, K. Matthews, and J. Hutson. 2014. Performance and carcass characteristics of Delaware chickens in comparison with broilers. *Poultry Science Association Inc.* 23 (4): 586-592
- Schmidt C.J., M. E. Persia, E. Feierstein, B. Kingham, and W. W. Saylor. 2009. Comparison of a modern broiler line and a heritage line unselected since the 1950s. *Poultry Science*. 88 (12): 2610-2619