# RESPONSE OF CHICKENS (*Gallus gallus*) ON FEEDS FROM WASTE MILKFISH (*Chanos chanos*) BONES AND SCALES

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**ABSTRACT**

*This study aims to produce a low-priced yet high quality feeds using wastes from Chanos chanos (milkfish) bones and scales. Different ratios of milkfish bones and commercial feeds were fed to chickens. Following are the experimental setups: 100% milkfish feeds; 75% milkfish feeds and 25% commercial feeds; 50% milkfish feeds and 50% commercial feeds; 25% milkfish feeds and 75% commercial feeds; and 100% commercial feeds. Change in weight, wingspan girth circumference and fecal matter released by the broilers were recorded and analyzed.*

*Results showed that the most effective, with the greatest increase in the parameters measured, was observed in the broilers treated with 75% of milkfish feeds and 25% commercial feeds. This can be attributed to the additional nutritive value of milk fish bones and scales which is not present in commercially available feeds. On the other hand, the least change in growth was observed in broilers fed with 100% milkfish feeds. This suggests that the palatability of pure milkfish feeds is not comparable with the commercial ones. Further refinement of the feeds is necessary.*

*This study is of great significance to chicken raiser for lessen expenditures but of assured high quality growth of the broilers.*

## INTRODUCTION

The broiler-producing industry has been one of the most flourishing in the livestock and poultry sector for the past decades. It will continue to be the growth leader in the sector even in the world market. The Philippine broiler industry is projected to expand by nearly 4 percent this year, fuel.

The Philippines poultry sector grew by 4.53% in 2012, boosted by strong growth in chicken production (+4.61%), due to the high demand for chicken meat throughout the year end.

Alternative feeds from the kitchen wastes that are just dumped and spoiled, mostly fish bones and scales can be used to lessen the increasing trash in our houses. Thus, these wastes are no needed; they can still be useful in different aspects. Fish bones and scales have a great potential of helping to boost the growth of broilers. Due to the high mineral content of the bone fraction, this material can be well suitable as a natural calcium source as food, feed, or as supplement (Malde et al., 2010).

A good example of a popular fish that are usually used a home is *Chanos chanos* or also known as milkfish. Initial analysis showed that *Chanos chanos* (milkfish) bones and scales when boiled and pulverized contain 34.5% crude protein, 25.7% crude fat, 28.6% ash and 5.6% moisture.

This study primarily deals with the determination of broiler-response to *Chanos chanos* fish bones and scales as an alternative feed.

Specifically, this study seeks to find the answer to the following questions:

1. Is *Chanos chanos* a good alternative feed for broilers?
2. What ratio of the alternative feeds is the most effective in helping the increase in growth of broilers?
3. What will be the effect of the alternative feed to the broiler's growth? (weight, girth circumference, biomass and wingspan)

With the increasing demand of chickens in the country, creation of a cheaper and resourceful alternative feeds can be of help for the poultry industry. This feeds can lessen the increasing pile of kitchen wastes in homes:

*Poultry***.** Poultry owners are tasked to produce high quality chicken for market use. Creating alternative feeds can lessen their expenses but assured with the quality of the chickens.

*Cockfighters***.** This study can be applied by cockfighters in producing strong and healthy chicken.

*Researcher***.** Researchers can benefit from the results and the information that this study will produce.

This study covers the identification of the effectivity of *Chanoschanos*specifically fish bones and scales, as alternative feeds for broilers. The extent of the effect to the growth is bounded only to its physical characteristics such as weight, wingspan, girth circumference and the defecated biomass. The broiler used in this study is forty five (45) day chickens from a poultry farm in Imus, Cavite.

The physiological and chemical analyses of the chicken families are beyond the scope of the study. The study is conducted from June until August 2013 at Cavite City.

**METHODOLOGY**

*Preparation of materials*. Fish bones and scales were collected from market and households around the area of Cavite City. Chicken plates for feeding and commercial feeds are also needed in this study. Five cages with a dimension of 3ft by 3ft were created to house the chickens. For the measuring of parameters, measuring devices such as triple beam balance and measuring tape are used.

*Preparation of Feeds.* Three (3) kilos of *Chanos chanos* (milkfish) bones and scales were collected and clean the blood and excess meat. They are sundried for five (5) days. After drying, the fish bones and scales were pulverized. Commercial feeds were mixed with alternative feeds in different ratios. Table 1 shows the contents of the feeds in each treatment prepared.

***Table 1*. Ratio of feeds in each set up**

| Set up | Content (g) | |
|---|---|---|
| | Commercial Feeds | Fish bones and Scales |
| A | 0 | 100 |
| B | 25 | 75 |
| C | 50 | 50 |
| D | 75 | 25 |
| E | 100 | 0 |

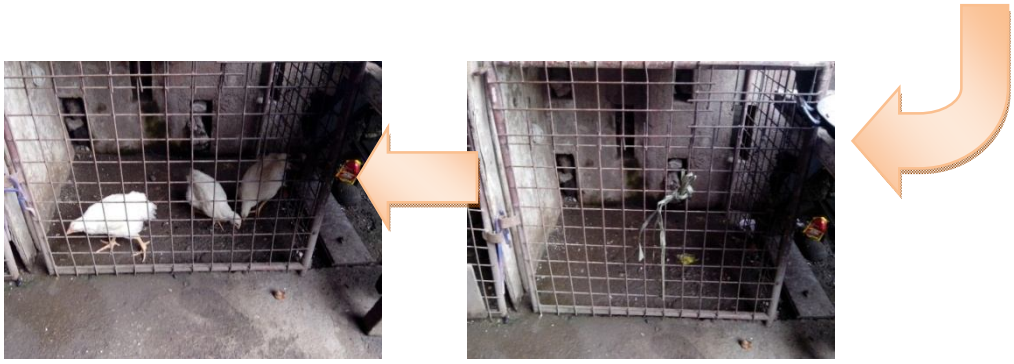
*Testing of Feeds.* On each set up, three broilers were assigned randomly. Initial mass (g), girth (in), wingspan (cm) were measured using triple beam balance, and measuring tape respectively. After 28 days of treatment, the mass (g), girth (in), wingspan (cm) were measured again. The fecal matter released by the broilers were collected and measured for the amount of fecal matter released.

*Data Analysis.* From the data gathered, the weight, wingspan, girth and fecal matter released per set-up were tallied together to get its mean.

Wash the fish bones and scales.

Remove the excess meat and blood from the fish bones.

Sundry the collected fish bones



Prepare 5 cages with same dimensions.

Place 3 broilers I each set up. Feed them accordingly with their set ups.

*Figure 1. Creation and testing of the alternative feeds for broilers*

**RESULTS AND DISCUSSION**

Feeds from *Chanos chanos* (milkfish) bones and scales were fed to broilers for the five (5) set ups. The bodily changes observed were recorded for every set up. After 28 days of treatment the mass (g) was measured.

Based on the results of the experiment, the highest change in mass was found in Set up B having 75g of alternative feeds and 25g of commercial feeds, followed by the broilers treated with Set up C containing 50g of alternative feeds and 50g of commercial feeds. The third highest development is the broilers fed with 25g alternative feeds and 75g of commercial feeds, placed in set up D. Finally, the broilers treated in Set up A with 100g of alternative feeds.

The controlled set up having 100g of commercial feeds has the lowest mass progression as compared to the four set ups.

*Table 2.* Change in weight of broilers after the treatment[1]

| Set up | Weight (g) | | |
|---|---|---|---|
| | Initial | Final | Change in Weight |
| A | 118.5 | 711.0 | 592.50 |
| B | 149.0 | 761.4 | 612.40 |
| C | 143.5 | 750.6 | 607.10 |
| D | 127.0 | 726.0 | 599.00 |
| E | 124.0 | 705.1 | 581.10 |

[1]*Setup A- 100% fish bone and scales; Setup B- 25% commercial feeds:75% fish bone and scales; Setup C- 50% commercial feeds: 50% fish bone and scales; Setup D- 75% commercial feeds: 25% fish and bone scales; and Setup E- 100% commercial feeds*

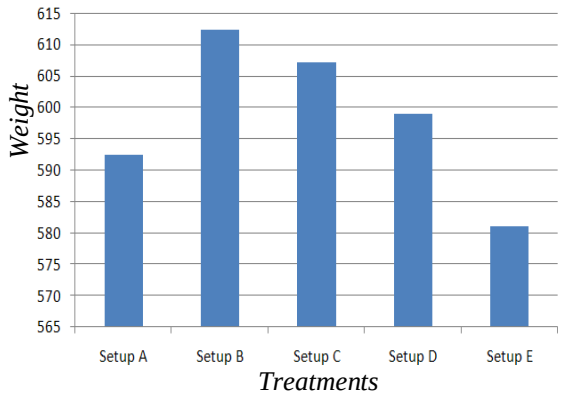



*Figure 2*. Change in weight of the broilers after the treatment **(***Setup A- 100% fish bone and scales; Setup B- 25% commercial feeds:75% fish bone and scales; Setup C- 50% commercial feeds: 50% fish bone and scales; Setup D- 75% commercial feeds: 25% fish and bone scales; and Setup E- 100% commercial feeds***)**

*Chanos chanos* fish bones and scales as feeds were supplied to the broilers in the five (5) set ups. The physical changes observed were recorded for every set up. After every set up 28 days of treatment, the wingspan was measured again.

Based on the results of the experiment, the broilers treated in Set up A with 100g of alternative feeds have the lowest wingspan development. On the other hand, the third lowest wingspan progression is broilers treated in Set up D with 25g alternative feeds and 75g of commercial feeds. The broilers treated in Set up C with 50g of alternative feeds and 50g of commercial feeds is the second to the highest on the wingspan progression. Lastly, the highest wingspan development is found in Set up B having 75g of alternative feeds and 25g of commercial feeds.

Set up B, C, and D as compared to the controlled set up E has higher wingspan development. Set up A, on the other hand, has lower progression on the wingspan compared to the controlled set up.

*Table 3*. Change in wingspan of broilers after the treatment[1]

| Set up | Wingspan (cm) | | |
|---|---|---|---|
| | Initial | Final | Change |
| A | 16.7 | 22.7 | 6.0 |
| B | 24.5 | 38.4 | 13.9 |
| C | 20.4 | 34.0 | 13.6 |
| D | 20.9 | 30.0 | 9.1 |
| E | 19.4 | 25.6 | 6.2 |

[1]*Setup A- 100% fish bone and scales; Setup B- 25% commercial feeds:75% fish bone and scales; Setup C- 50% commercial feeds: 50% fish bone and scales; Setup D- 75% commercial feeds: 25% fish and bone scales; and Setup E- 100% commercial feeds*

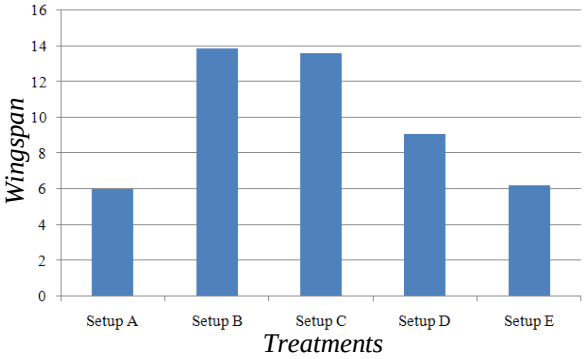



*Figure 3*. Change in wingspan of the broilers after the treatment **(***Setup A- 100% fish bone and scales; Setup B- 25% commercial feeds:75% fish bone and scales; Setup C- 50% commercial feeds: 50% fish bone and scales; Setup D- 75% commercial feeds: 25% fish and bone scales; and Setup E- 100% commercial feeds***)**

The feeds from *Chanos chanos* fish bones and scales were fed to the broilers in the five (5) set ups. Physical changes observed were recorded for every set up. After 28 days of treatment, the fecal matter release was measured.

Based on the results of the experiment, the second lowest mass was in Set up A with 100g of alternative feeds. The third to the lowest fecal matter released was found in Set up C with 50g of alternative feeds and 50g of commercial feeds. The broilers treated in Set up D with 25g alternative feeds

and 75g of commercial feeds is the second to the highest fecal matter released. Finally, the highest fecal matter released was found in Set up B with 75g of alternative feeds and 25g of commercial feeds.

The controlled set up compared to the four set ups has the lowest fecal matter release.

*Table 4.* Average fecal matter released after the treatment[1]

| Set up | Fecal Matter (g) |
|---|---|
| A | 9.0 |
| B | 11.1 |
| C | 9.5 |
| D | 9.8 |
| E | 8.5 |

[1]*Setup A- 100% fish bone and scales; Setup B- 25% commercial feeds:75% fish bone and scales; Setup C- 50% commercial feeds: 50% fish bone and scales; Setup D- 75% commercial feeds: 25% fish and bone scales; and Setup E- 100% commercial feeds*

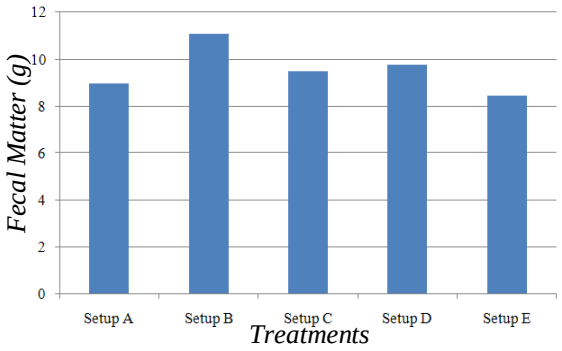



*Figure 4.* Average fecal matter released after the treatment **(***Setup A- 100% fish bone and scales; Setup B- 25% commercial feeds:75% fish bone and scales; Setup C- 50% commercial feeds: 50% fish bone and scales; Setup D- 75% commercial feeds: 25% fish and bone scales; and Setup E- 100% commercial feeds***)**

Broilers were fed with *Chanos chanos* fish bones and scales as alternative feeds to the five (5) set ups. Physical changes observed were recorded for every set up. After 28 days of treatment, the girth circumference was measured again.

Based on the results of the experiment, the highest girth circumference was found in Set up B having 75g of alternative feeds and 25g of commercial feeds, followed by set up C with 50g of alternative feeds and 50g of commercial feeds. The third highest girth circumference was found in set up D with 25g alternative feeds and 75g of commercial feeds. Lastly, the lowest circumference was in Set up A with 100g of alternative feeds.

The controlled set up as compared to set ups B, C,and D has lower girth circumference while the controlled set up has higher girth circumference than Set up A.

*Table 5.* Change in girth circumference of the broilers after the treatment[1]

| Set up | Initial | Final | Change |
|---|---|---|---|
| A | 17.3 | 31.7 | 14.4 |
| B | 19.0 | 40.2 | 21.2 |
| C | 18.8 | 37.7 | 18.9 |
| D | 17.7 | 34.4 | 16.7 |
| E | 17.2 | 30.6 | 13.4 |

[1]*Setup A- 100% fish bone and scales; Setup B- 25% commercial feeds:75% fish bone and scales; Setup C- 50% commercial feeds: 50% fish bone and scales; Setup D- 75% commercial feeds: 25% fish and bone scales; and Setup E- 100% commercial feeds*

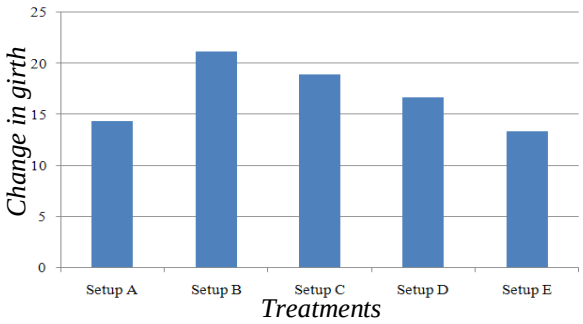



*Figure 5.* Change in girth circumference of the broilers after the treatment **(***Setup A- 100% fish bone and scales; Setup B- 25% commercial feeds:75% fish bone and scales; Setup C- 50% commercial feeds: 50% fish bone and scales; Setup D- 75% commercial feeds: 25% fish and bone scales; and Setup E- 100% commercial feeds***)**

## CONCLUSION

From the data gathered from the study, it was concluded that *Chanos chanos* (milkfish) bones and scales is a potential alternative feed for broilers.

*Chanos chanos* showed significant effect on the physical changes over the broilers; therefore it proves that the five ratios of alternative feeds enhanced the growth of the broilers. Results showed that Set up B which contains 75g of alternative feeds and 25g of commercial feeds catered to the broilers showed the outstanding development.

The growth observed in different concentration of alternative feeds, positively is an indicative of the protein, calcium and other minerals present on the *Chanos chanos* bones and scales. The experiment showed the different changes in the weight, wingspan, girth circumference, and biomass occurred in the broilers catered with the feeds. The response of the broilers to the feeds displays their need.

This proves that the alternative feeds from milkfish allow the boost of growth of the broilers with the right concentration and mixture with commercial feeds. Ocular observation can also determine the results of the growth of each broiler in each set ups.

Since it was proven that *Chanos chanos* bones and scales are potential alternative feed to broilers, the researchers would like to offer the following recommendations:

1. Determine through chemical analysis the composition and properties present in the bones and scales of *Chanos chanos* which contributed to the boost of growth of broilers;

2. Know the other species of fish that probably can be also an alternative feed

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