The effect of chicken eggshell on chicken layers

PHILIPPINE YUH CHIAU SCHOOL DEL PILAR, CABATUAN, ISABELA In partial fulfillment of the requirements in Research II and Advanced Statistics The Effect of Chicken (Gallus Gallus Domesticus) Eggshells in the Mass of Chicken Layers and Nutritional Content of Chicken Eggs Submitted by: Iris Kaye L. Madrid Arvin Jon S. Acuna Neil Renzo D. Agonoy Alejandro D. Galera Acknowledgement The researchers would like to convey their heartfelt thanks to the following who contributed to the success of the study: To the researchers parents, Alexander S. Madrid, Catherine L. Madrid, Reynaldo C. Agonoy, Melita D. Agonoy, Alejandro S.

Galera Sr. , Venus D. Galera, Andy Francis G. Acuna, Joselyn S. Acuna for expressing their support throughout the research duration. To Philippine YuhChiau School, for opening the researcher eyes in the field of science and technology. To the department of science and technology region II, for giving the information they used through nutritional analysis. To the researchers technicsl adviser, Mrs. Brasilia A. Uy, for her guidance and technical advices. To the grammar adviser, Mr. Sander Sedano for correcting the grammar of this paper. And above all to the God almighty, the greatest researcher of all.

This one is for you. Abstract This study implies the Effect of Chicken (Gallus gallus domesticus) eggshells in the mass of Chicken layers and Nutritional Content of Chicken Eggs. The study’s objectives were to investigate whether Chicken (Gallus gallus domesticus) eggshells can affect the mass of the chicken layers and if Chicken (Gallus gallus domesticus) eggshells can affect the quality of eggs in terms of nutritional analysis. Laying hens have a high demand for calcium, especially during egg production when calcium output is at its greatest (Scott et al, 2002).

Complete Randomized Design was used to find out the effect of Chicken (Gallus gallus domesticus) eggshells in the mass of the chicken layers. There were five (5) treatments used in this study: 50% Ca, 50% H20; 25% Ca, 75% H20; 4% Ca, 96% H20; 10% Ca, 90% H20; 100% H20, respectively. Each treatment comprised five (5) replications. Moreover, a sample egg underwent nutritional analysis in the Department of Science and Technology-Region II. On October 30, 2011, the average mass of the experimental units was 1. 544 kg. On November 15, 2011, the average mass was 1. 592 kg. Last November 30, 2011, the average mass increased to 1. 2 kg. Statistical calculations produced an Fc less than Ftab at 0. 05 level of significance, therefore, Ho is rejected. 0. 19 is obtained as the LSD value. Based on the egg nutritional analysis, out of 100 grams, there was moisture of 77. 54%, 1. 12% ash, 11. 18% crude protein, 7. 8% total fat, and 2. 36% carbohydrate, respectively. The researchers recommend commercializing Chicken Eggshells as calcium Supplement to be used by the poultry industry for economic improvement. Table of Contents Title Page…….

……

 Chapter I (Introduction) A. Background of the Study Laying hens have a high demand for calcium, especially during peak egg production when calcium output is at its greatest; Calcium metabolism is also under strain in

the later stages of egg production, when hens have a decrease in calcium absorption efficiency (Al-Batshan et al. , 1994). Egg producers primarily use two supplemental sources of dietary calcium.

Producers have been using shells for more than 100 years (Roland and Bryant, 1999), in which time it has become a supplement for maintaining the layers' health. Eggshell is one of the largest potential calcium supplements because it contains 98. 2% of calcium carbonate with trace amounts of magnesium and phosphorous. According to some literatures, they are all essential for both the layers and egg's development. The food processing industry is in need of research to find alternative methods for processing and using eggshells and hatchery waste in an environment- friendly way. In connection to this, people utilize egg in their daily life.

However, people only use the yolk and the albumen. After that, people throw away the eggshell. Instead of wasting the potential of eggshells, the researchers decided to study the use of the eggshells as a food supplement for chicken layers. According to the National Research council on poultry nutritionist, increasing calcium for layers can make them lay stronger eggshells, decreasing the possibility of the eggs being crushed. The quality of egg becomes high in terms of shell structure and its nutritional content. More than that, increasing calcium in the nutrition of chicken layers can make them healthier in terms of bone rigidity.

Because the commercial egg industry now needs to break a higher proportion of eggshell in line for production of liquid egg products, there is increased justification for using eggshells as a dietary supplement rather

than discarding them. The team aimed to create a new formulation of calcium supplement is the efficient and most effective matter. B. Statement of the Problem This study, The Effect of Chicken (Gallus Gallus Domesticus) Eggshells in the Mass of Chicken Layers and Nutritional Content of Chicken Eggs aims to answer the following question: 1. Can chicken (Gallus Gallus Domesticus) eggshells affect the mass of the layers? . Can chicken (Gallus Gallus Domesticus) eggshells affect the quality of the egg in terms of nutritional content? Statement of the hypothesis: * Chicken (Gallus Gallus Domesticus) eggshells cannot affect the mass of the layers. (T1= T2= T3= T4= T5) * Chicken (Gallus Gallus Domesticus) eggshells cannot affect the quality of the egg in terms of nutritional content. (T1= T2= T3= T4= T5). C. Significance of the Study Laying hens should be given proper calcium rich feed as well as calcium supplements in their diet not only for the formation of egg shell but also for the high quality of egg necessary for the prevention of breakage.

It is the best interest of poultry breeders to obtain as many top quality eggs from each hen. Similarly, eggshell quality is great interest to egg producers. Reductions in eggshell quality are associates with economic losses. It is essential for the layers to assure adequate nutrition. According to a survey conducted by the National Poultry Breeders Association, hens produced approximately 300eggs per year must deposit 24 times more calcium into egg in their bones. For that reason, the requirements of calcium supply in their diet are enormous.

This is the reason why the researchers devised a plan to utilize powdered eggshells as calcium supplement to increase the mass, size and quality of

the egg produced by chicken layers for the benefit of the poultry industry. D. Scope and Delimitation This study, the effect of chicken (Gallus Gallus Domesticus) eggshells in the size, mass and quality of eggs focuses on the difference between a hen when subjected to calcium supplement and hen without being subjected to any calcium supplement (control).

Based on the National Research Council on Poultry Nutritionists, the recommended daily intake of calcium for layers is 3. 25 grams. The materials were gathered at Good Taste Bakery (Galera’s Bakery) situated in purok 6, Salinungan West, San Mateo, Isabela. The start of the study is upon approval until February, 2012. The parameters of the nutritional analysis performed were moisture, ash, crude protein, total fat, and carbohydrate, respectively. This study does not include the eggshell quality. It does not include the quality of meat of the chicken layers nor the shell of the chicken eggs.

E. Definition of Terms Eggshell- refers to the raw material that was used as a calcium supplement. Chicken- refers to the Gallus Gallus Domesticus specie; it served as the experimental unit. Dietary Supplement- refers to the powdered eggshell. Poultry- refers to a category of domesticated birds kept by humans for the purpose of collecting eggs. Egg quality- refers to quality of the egg; it will be measured through nutritional analysis. Mass of layers- refers to the mass gain of layers; it will be measured through weighing scale. CHAPTER II (Review of Related Literature)

A. Related Studies According to Scott et al (1971), the larger particles remain in the upper digestive tract (crop and gizzard) for a longer period of time than the ground Ca sources, resulting in Ca being available to the hen for a

longer period of time. A larger particle Ca may therefore be beneficial to hen during the 8 to 9 hrs dark period when feed is not consumed but Ca requirements are high due to eggshell formation (Etehes, 1987). Roland (1986) concluded that large particle size has no effect on shell quality when Ca levels in the diet are adequate.

Poor eggshell quality still results in a significant number of eggs being unable, even with adequate dietary Ca. Calcium nutrition plays a significant role in bone quality of the laying hen. Poor bone quality in laying hens can lead to many problems, which include broken or weak bones, osteoporosis, economic losses and difficulties at processing plants that can result in bone fragments in meat products (Whitehead and Fleming, 2000; Webster 2004 , Julian 2005). Large particle Ca has been shown to have a positive effect on layer bone quality (Guinotte and Nys, 1991; Rennie et al, 1997; Fleming et al, 1998b).

The composition of different Ca sources can vary (Reid and Weber, 1976) and sources can vary (Reid and Weber, 1976) and may be a result of the location in which it is mined. Sources may vary in the amount of Ca and the presence of other nutrients, which can affect utilization of the Ca source by the laying hen (Reid and Weber , 1976). Therefore the objective of this study was to examine the effect of 3 potential new locally available Ca sources and the effect of particle size on laying hen production performance, eggshell quality and bone quality.

The value of both Ca sources to the hen has been the focus of many studies. In a review Roland (1986) concluded that about half of studies comparing

ground limestone to large particle oyster shell quality, whereas the rest found that eggshell quality was not affected. At www. curezone. com, a study by Hal Ewing, B. S. C, it was recently being studies if eggshells really have the potential to be a calcium supplement. B.) Related Literatures * Calcium Carbonate * Calcium carbonate, or CaCO3, comprises more than 4% of the earth’s crust and is found throughout the world.

It’s most common natural forms are chalk, limestone, and marble, produced by the sedimentation of the shells of small fossilized snails, shellfish, and coral over millions of years. Although all three forms are identical in chemical terms, they differ in many other respects, including purity, whiteness, thickness and homogeneity. Calcium carbonate is one of the most useful and versatile materials known to man. * The composition of different calcium may vary (Reid and Weber, 1976), and may be a result of the location in which it is gathered. Sources may vary in the amount of calcium source by the laying hen (Reid and Weber, 1976). Calcium carbonate is very important in the rigidity of the bones. It is very essential for the eggs to increase its weight. (North and Bell, 1990; Angulo et al. , 1987) * The eggshell consists predominantly of a matrix of interwoven protein fibers and calcium carbonate crystals, and the cuticle covers the surface of the shell, which is a foamy layer of protein. * Egg * The egg is a biological structure intended by nature for reproduction. It protects and provides a complete diet for the developing embryo, and serves as the principal source of food for the first few days of the chick’s life.

The egg is also one of the most nutritious and versatile of human foods. * The physical composition of an avian, particularly chicken, egg contains

protein, lipid, carbohydrates, potassium, sodium, phosphorus, calcium, magnesium, and iron. * The yolk accounts for 34%-35%, the albumen 52%-58%, and the shell accounts for 9%-14% of the total egg components. * An average-sized egg weighs approximately 57 grams (about 2 ounces). Of this weight, the shell constitutes 11 percent; the white, 58 percent; and the yolk, 31 percent. Normally, these proportions do not vary appreciably for small or large eggs.

The percentage composition of the edible portions is: Table 1. Nutritional Value of Eggs* TYPE OF EGG| Energy| Protein| Fat| Ash| Carbohydrate| | (kcal)| (g)| (g)| (g)| (g)| Chicken Egg (1 pc = 48 g)| 77| 5. 9| 5. 3| 1. 3| 2. 2| Source: http://www. fnri. dost. gov. ph/ * Poultry * The act of raising chickens, turkeys, ducks, and other fowl for meat or eggs. * Native chickens have a number of useful characteristics, including the ability to thrive on coarse feeds, resistance to diseases, and lower nutrient requirements. Chickens can rest at night and on rainy days under shelter.

A cardboard box, with dried weeds or rice straw inside, can be put under a tree, about 20cm from the ground, as a nest. Discarded containers such as tin cookie boxes with a stone inside are used as feed troughs and water containers. Feed troughs can also be made of wood. * Modern poultry production occurs primarily in enclosed buildings to protect the birds from weather, predators, and the spread of diseases from wild birds. This has allowed farmers to greatly increase production efficiency while significantly reducing the amount of labor required. Chicken broiler and egg production are the most progressive animal enterprises in the Philippines today. The poultry industry in fact began as a backyard enterprise but has shifted to the

formation of very large integrated contract farming operations. * Chicken * Chicken (Gallus Gallus Domesticus) is a domesticated fowl, a subspecies of the Red Jungle fowl. As one of the most common and widespread domestic animals, and with a population of more than 24 billion in 2003, there are more chickens in the world than any other species of bird. Humans keep chickens primarily as a source of food, consuming both their meat and their eggs.

The traditional poultry farming view of the domestication of the chicken is stated in Encyclopedia Britannica (2007). * Chickens are omnivores. In the wild, they often scratch at the soil to search for seeds, insects and even larger animals such as lizards or young mice. * The adult rooster can be distinguished from the hen by his larger comb * Chickens may live for five to ten years, depending on the breed. In commercial intensive farming, a meat chicken generally lives six weeks before slaughter. A free range or organic meat chicken will usually be slaughtered at about 14 weeks.

Hens of special laying breeds may produce as many as 300 eggs a year. After 12 months, the hen’s egg-laying ability starts to decline, and commercial laying hens are then slaughtered and used in processed foods, or sold as “ soup hens”. The world’s oldest chicken, a hen, died of heart failure at the age of 16 according to the Guinness Book of World Records. * More than 50 billion chickens are reared annually as a source of food, for both their meat and their eggs. Chickens farmed for meat are called broiler chickens, whilst those farmed for eggs are called egg-laying hens.

In total, the UK alone consumes over 29 million eggs per day. Some hens can produce over 300 eggs per year. Chickens will naturally live for 6 or more years, but broiler chickens typically take less than six weeks to reach slaughter size. For laying hens, they are slaughtered after about 12 months, when the hens' productivity starts to decline, by which point they are normally infirm and have lost a significant amount of their feathers, and their life expectancy has been reduced from around 7 years to less than 2 years. Chapter III (Methodology) A. Materials, tools, and Equipment 1. Materials 1 sack (50 kg) of eggshells * Water(1-10 gallons depending on the project duration) * Commercial Feeds * 25 chicken (Gallus Gallus Domesticus) layers 2. Tools and Equipment * Chicken coop * Food and water container B. Research Design Complete Randomized Design was used to find out the effect of Chicken (Gallus Gallus Domesticus) eggshells in the mass of the chicken layers. T1R3 T1R5 T1R4 T1R2 Overall, there are five (5) treatments: 50% Ca, 50% H20; 25% Ca, 75% H20; 4% Ca, 96% H20; 10% Ca, 90% H20; 100% H20, respectively. Each treatment comprises five (5) replications. T2R3 T2R5 T2R4 T2R2 T2R1 T3R1

T3R2 T3R3 T3R4 T3R5 T4R1 T4R2 T4R3 T4R4 T4R5 T5R1 T5R2 T5R3 T5R4 T5R5 C. Flowchart of the General Procedure Apply the treatments to the chicken, including the commercial feeds Formulate the treatments Distribute the chickens into the chicken coop Purchase 25 Gallus Gallus Domesticus Construct the Chicken Coop Pound the Eggshells Wash the Eggshells Gather Eggshells Purchase commercial feeds Apply the treatments to the chickens, including the commercial feeds Go to DOST for nutritional analysis Record

the results D. Research Layout 50% Ca 50% H20 25% Ca 75% H20 4% Ca 96% H20 T1 T2`T3T4T5 100% H20 10% Ca 90% H20

T= treatment *The following treatments were approved by Dr. Florito R. Dapona, Jr. (Veterinarian), Paul Winston Lucas (Animal Husbandry Graduate), Reden Borja (Animal Science Graduate) and Jomar Caingat (Animal Science Graduate). E. General Procedure 1. The eggshells were gathered in Good Taste Bakery owned by the Galera Family at Purok 6, Salinungan West, San Mateo, Isabela. 2. The eggshells were washed thoroughly but do not remove the inner skin of the egg. 3. The eggshells were pounded until powderized. 4. Twenty-five (25) chickens (Gallus gallus Domesticus) layers were purchased and subjected to experimentation.

They must be of the same age and size. 5. Each chicken was distributed separately into the chicken coop. 6. Commercial feeds were purchased for food consumption of the chicken layers. 7. The 5 treatments (50% Ca-50% H20, 75% Ca-25% H20, 96% Ca-4%H20, 90% Ca-10% H20) were given to the chickens. 8. Results were recorded on the size and mass of the layers. 9. The researchers went to the Department of Science and Technology for nutritional analysis of the eggs. 10. Results were compiled and interpreted. #7Final treatments After a series of gathering pieces of information, the researchers came up with its final treatment.

The National Research Council on poultry nutritionists has published daily requirement for commercial layers. In addition, it was approved by the researchers, technical advisers. The requirement for the commercial layers was reported as a percentage of the diet when the hen consumes 100 g of

feed. Calcium| 4%| Calcium| 3. 25 grams| The researchers decided to have 4 treatments and a control. It was based from the NRCPN recommended daily intake of chicken layers T3 96% water—81. 25 mL 4%powdered eggshell—3. 25 g T1 50%water—40. 625 mL 50%powdered eggshell—1. 625 T4 90% water—73. 125 mL 0% powdered eggshell—0. 325 g T2 75% water – 60. 328 mL 25% powdered eggshell—0. 8125 g T5 100% water—100 mL (control) CHAPTER IV (RESULTS AND DISCUSSIONS) This chapter shows the outcome of documenting the mass difference of the experimental layers from four (4) different dates: October 30 2011; November 15, 2011; November 30, 2011; December 9, 2011, respectively. The following are the raw data collected on the said dates. Experimental Unit| Mass (in kg)| C1| 1. 7| C2| 1. 7| C3| 1. 5| C4| 1. 6| C5| 1. 7| C6| 1. 5| C7| 1. 7| C8| 1. 8| C9| 1. 7| C10| 1. 7| C11| 1. 6| C12| 1. 7| C13| 1. 6|

C14| 1. 5| C15| 1. 7| C16| 1. 5| C17| 1. 5| C18| 1. 6| C19| 1. 6| C20| 1. 7| C21| 1. 6| C22| 1. 6| C23| 1. 6| C24| 1. 5| C25| 1. 6| Table 1. 1: List of mass of the twenty five (25) experimental units as of October 30, 2011 (in Kg) Legend: C = Chicken The masses of the 25 experimental units as of October 30, 2011 are shown at table 1. 1. The masses shown are the initial mass of the experimental units. Calculations showed an average mass of 1. 544 kg. The mass of the experimental units as of this date was not affected by the treatments, because the treatments were not yet applied. Table 1. : List of mass of the twenty five (25) experimental units as of November 15, 2011 (in Kg) Experimental Unit| Mass (in kg)| C1| 1. 6| C2| 1. 4| C3| 1. 55| C4| 1. 6| C5| 1. 7| C6| 1. 45| C7| 1. 7| C8| 1. 8| C9| 1. 6| C10| 1. 5| C11| 1. 5| C12| 1. 6| C13| 1. 4| C14| 1. 6| C15| 1. 5| C16| 1. 4| C17| 1. 5| C18| 1. 6| C19| 1. 6| C20|

1. 5| C21| 1. 6| C22| 1. 4| C23| 1. 5| C24| 1. 6| C25| 1. 4| Legend: C = Chicken The masses of the 25 experimental units as of November 15, 2011 are shown on table 1. 2. These masses of the experimental units are affected by the applied treatments to their respective replications and experimental units.

There was an increase on the average mass of the experimental units, showing and average mass 1. 592 kg. Table 1. 3: List of mass of the twenty five (25) experimental units as of November 30, 2011 (in Kg) Experimental Unit| Mass (in kg)| C1| 1. 7| C2| 1. 7| C3| 1. 5| C4| 1. 6| C5| 1. 7| C6| 1. 5| C7| 1. 7| C8| 1. 8| C9| 1. 7| C10| 1. 7| C11| 1. 6| C12| 1. 7| C13| 1. 6| C14| 1. 5| C15| 1. 7| C16| 1. 5| C17| 1. 5| C18| 1. 6| C19| 1. 6| C20| 1. 7| C21| 1. 6| C22| 1. 6| C23| 1. 6| C24| 1. 5| C25| 1. 6| Legend: C = Chicken The masses of the 25 experimental units as of November 30, 2011 are shown on table 1. 3.

The continued application of treatments to the experimental units caused another mass increase, with an average mass of 1. 62 kg. Table 1. 4: List of mass of the twenty five (25) experimental units as of December 9, 2011 (in Kg) Experimental Unit| Mass (in kg)| C1| 1. 5| C2| 1. 5| C3| 0. 95| C4| 1. 4| C5| 1. 4| C6| 1. 5| C7| 1. 5| C8| 1. 8| C9| 1. 7| C10| 1. 6| C11| 1. 5| C12| 1. 3| C13| 1. 3| C14| 1. 4| C15| 1. 3| C16| 1. 4| C17| 1. 4| C18| 1. 3| C19| 1. 5| C20| 1. 5| C21| 1. 5| C22| 1. 5| C23| 1. 6| C24| 1. 4| C25| 1. 4| Legend: C = Chicken The masses of the 25 experimental units as of December 9, 2011 are shown on table 1. 4.

A sudden decrease on the average mass of the experimental units occurred during this date. But, the mass decrease is not caused by the continuation of

the application of the treatments. The mass decrease is caused by the recent typhoon Sendong that brought diseases to the experimental units. Table 1. 5: Complete table of acquired data and averaged results on different treatments on dates: October 30, 2011, November 15, 2011, November 30, 2011, and December 9, 2011 (in kg) Legend: C = Chicken Table 1. 5 shows the complete results of data gathering on dates: October 30, 2011, November 15, 2011, November 30, 2011, and December 9, 2011.

It also shows the summation of data from different replications and the averaged data of different treatments. Treatment 2 (75% water – 60. 328 mL: 25% powdered eggshell—0. 8125 g) shows the highest average mass of the experimental units compared to the other treatments. This is in line with one of the problems stated can chicken (Gallus Gallus Domesticus) eggshells affect the mass of the layers? After a series of gathering data, results showed that there was a significant difference between treatment 1 (50%water—40. 625 mL: 50%powdered eggshell—1. 625 g) and treatment 2 (75% water – 60. 328 mL: 25% powdered eggshell—0. 125 g) with 0. 27 mean difference; treatment 2(75% water – 60. 328 mL: 25% powdered eggshell—0. 8125 g) and treatment 3(96% water—81. 25 mL: 4%powdered eggshell—3. 25 g) with 0. 26 mean difference; and treatment 2(75% water – 60. 328 mL: 25% powdered eggshell—0. 8125 g) and treatment 4 with 0. 26 mean difference. The test for least significant difference displayed a value of 0. 19 which became the basis of obtaining the treatments which exhibited significant difference. A. Statistical Analysis of the Mass of the Layers On October 30, 2011, the average mass of the experimental units was 1. 544 kg.

On November 15, 2011, there was a slight increase in the average mass with 1. 592 kg. Meanwhile, last November 30, 2011, the average mass increased to 1. 62 kg. On December 9, 2011, the average mass decreased to 1. 446 kg due to factors like typhoon and poultry diseases. Following is the list of ANOVA table obtained from October 30 to December 9, 2011. Table 1. 1 ANOVA Table of the mass obtained from October 30 to December 9, 2011. Source of Variance| Degree of freedom | Sum of square| Mean Square | F-ratio| 0. 05| 0. 01| Treatment| 4| 0. 2469| 0. 06| 3| 2. 87| 4. 43| Error| 20| 0. 366| 0. 02| | | | Total| 24| 0. 6125| | | | |

The table shows the ANOVA table computed from October 30, 2011 to December 9, 2011. Treatment and error served as sourced of variance. The treatment exhibited a degree of freedom of 4 while the error exhibited a degree of freedom of 20. The treatment sum of squares was 0. 2469 while the error sum of squares was 0. 366. Moreover, the treatment mean square was 0. 06 while the error mean square was 0. 02. The computed value of F was 3, which is greater than the tabulated value of F of 2. 87at 0. 05 level of significance. Since Fc

LSD Computation LSD = 2. 086(2(0. 02))? / 5 = 0. 19 Significant Difference: T1 Vs. T2 T2 Vs. T3 T2 Vs. T4 T1 vs. T2 = 0. 27Significant vs. T3 = 0. 02Not Significant vs. T4 = 0. 07Not Significant vs. T5 = 0. 13Not Significant T2 vs. T3 = 0. 26Significant vs. T4 = 0. 20Significant vs. T5 = 0. 14Not Significant T3 vs. T4 = 0. 06Not Significant vs. T5 = 0. 12Not Significant T4 vs. T5 = 0. 06Not Significant Based on the computed LSD value, the comparison of treatment 1 to treatment 2; treatment 2 to treatment 3; treatment 2 to

treatment 4, showed a significant difference when it comes to mass among the experimental units.

B. Relation of Findings to Related Literatures Eggshell is one of the largest potential calcium supplements because it contains 98. 2% of calcium carbonate with trace amounts of magnesium and phosphorous. According to literatures, they are all essential for both the layers and egg’s development. (Whitehead and Fleming, 2000; Webster 2004, Julian 2005). This is particularly true based on the four recorded results conducted every fifteen days from October 30, 2011 to December 9, 2011 in the study, The Effect of Chicken (Gallus gallus domesticus) Eggshells in the Mass of Chicken Layers and Nutritional Content of Chicken Eggs.

It is essential for the layers to assure adequate nutrition. According to a survey conducted by the National Poultry Breeders Association in 2009, hens produced approximately 300 eggs per year must deposit 24 times more calcium into egg in their bones. For that reason, the requirements of calcium supply in their diet are enormous. The NPBA survey supplemented the results, just like what happened in treatment three (3) where 3. 25 grams of powdered eggshell was used, it exhibited a significant increase in mass and a rigid eggshell quality as well.

December 9, 2011, which was the last time results were gathered, decreased from 1. 62 kg to 1. 45 kg. However, it is secondary since this was due to factors like typhoon and poultry diseases. At www. curezone. com, a study by Hal Ewing, B. S. C, it was recently being studies if eggshells really have the potential to be a calcium supplement. After a series of data

gathering, the National Research Council on Poultry Nutritionists has published daily requirement for commercial layers (treatment 3) was the most recommendable among the treatments. Calcium carbonate is very important in the rigidity of the bones.

It is very essential for the eggs and the layers to increase its weight. (North and Bell, 1990; Angulo et al. , 1987). The food processing industry is in need of research to find alternative methods for processing and using eggshells and hatchery waste in an environment- friendly way. Instead of wasting the broad potential of eggshells, the proponents hypothesized that the use of the eggshells will be a good food supplement, and based on the statistical analysis of the mass of the experimental unit, the alternative hypothesis, chicken (Gallus Gallus Domesticus) eggshells can affect the mass of the layers, was accepted.

II. Nutritional Analysis of the Chicken Eggs *Moisture| *Ash| *Crude Protein| *Total Fat| *Carbohydrate| 77. 54%| 1. 12%| 11. 18%| 7. 8%| 2. 36%| *parameters Based on the nutritional analysis of the egg performed last February 28, 2012, out of 100 grams, there was moisture of 77. 54%, 1. 12%ash, 11. 18% crude protein, 7. 8% total fat, and 2. 36% carbohydrate, respectively. Therefore, the chicken (Gallus Gallus Domesticus) eggshell can affect the nutritional content of the chicken egg, in a positive manner. A. Relation of Findings to Related Literatures Table 1.

Nutritional Value of Eggs* TYPE OF EGG| Energy| Protein| Fat| Ash| Carbohydrate| | (kcal)| (g)| (g)| (g)| (g)| Chicken Egg (1 pc = 48 g)| 77| 5. 9| 5. 3| 1. 12| 2| Source: http://www. fnri. dost. gov. ph/ From the nutritional

analysis conducted by the Department of Science and Technology-Region II, there is a difference on the percentage composition of nutritional components of the eggs produced by the experimental units, compared to the nutritional value of an ordinary egg. The eggs produced by the experimental units subjected to the treatment have a significant increase of 5. 8% in Protein, and a decrease of 2. 5% in Fat. Therefore, chicken (Gallus gallus domesticus) eggshells can affect the quality of eggs in terms of nutritional content. CHAPTER V (SUMMARY, CONCLUSION, AND RECOMMENDATIONS) A. Summary This study infers the Effectiveness of Chicken (Gallus Gallus Domesticus) in the mass of the chicken layers and Nutritional Content of Chicken Eggs. Based on the conducted weigh-in of the chickens from the 30th day of October, 2011 to the 9th of December of the same year, there was a mass increase.

Contrary to the proposed hypothesis, Chicken (Gallus Gallus Domesticus) eggshells can affect the mass of the layers. Therefore, the null hypothesis was rejected that all the treatments are equal with respect to mass. Based on the nutritional analysis of the egg performed last February 28, 2012, out of 100 grams, there was moisture of 77. 54%, 1. 12%ash, 11. 18% crude protein, 7. 8% total fat, and 2. 36% carbohydrate, respectively. Therefore, the chicken (Gallus Gallus Domesticus) eggshell can affect the nutritional content of the chicken egg, in a positive manner.

Because the commercial egg industry now needs to break a higher proportion of eggshell in line for production of liquid egg products, there is increased justification for using eggshells as a dietary supplement rather than discarding them. B. Conclusion Based on the conducted study, The

Effect of Chicken (Gallus Gallus Domesticus) Eggshells in the Mass of Chicken Layers and Nutritional Content of Chicken Eggs, the following conclusions were drawn: 1. The utilization of Chicken (Gallus Gallus Domesticus) Eggshells can affect in the mass of the experimental units, particularly the Chicken Layers. . The utilization of Chicken (Gallus Gallus Domesticus) Eggshells can affect in the quality of eggs when it comes to nutritional content. After the series of gathering data, the null hypotheses stated in Chapter I were rejected at 0. 05 level of significance and by qualitative analysis through nutritional testing. Therefore, the alternative hypotheses that Chicken (Gallus Gallus Domesticus) Eggshells can affect in the mass of the experimental units, particularly the Chicken Layers, is accepted. C. Recommendation The researchers recommend the following: 1.

Formulate new treatments to open the possibility to produce more effective concentrations as calcium supplement. 2. Pursue the research study on the potentials of Chicken Eggshells by applying it to other poultry animals like ducks, quails and the like. 3. Commercialization of Chicken Eggshell as calcium Supplement to be used by the poultry industry for economic improvement. Bibliography * King, Rebekah M. , University of New England, Master’s Thesis, Seleniuim Source and Level in Laying Hens: Effects on Egg Quality and Layer Performance (2002) * Firefly Encyclopedia of Birds, Ed.

Perrins, Christopher. Buffalo, N. Y. : Firefly Books, Ltd. , 2003. * Garrigus, W. P. (2007), “ Poultry Farming”. Encyclopedia Britannica. * R. Scott Beyer, PhD, Associate Professor, Poultry Nutrition Management, KansasState University * VelmuruguRavindran, Monogastric Research Centre, Institute of Food, Nutrition and Human Health, Massey University, Palmerston North, New

Zealan * F. Sultana1*, M. S. Islam and M. A. R. Howlider; Department of Poultry Science, Bangladesh Agricultural University, Mymensingh, 2202, Bangladesh * Makled, M. N. and O.

W. Charles, 1987. Eggshell qualityas influenced by sodium bicarbonate, calcium source, and photoperiod. Poul, Sci. , 66: 705-712. * McNaughton, J. L. , J. L. Dilworth and E. J. Day, 1974. Effectof particle size on the utilization of calcium supplements by the chicks. Poult. Sci. , 53: 1024-1029. * Commercial chicken production manual, 4th Ed. , Chapman and Hall, pp: 569-585. * Scheideler, S. E. , 1998. Eggshell calcium effects on eggquality and Ca digestibility in first-or third-cyclelaying hens. J. Appl. Poult. Res. , 7: 69-74. * Gerry, R. W. , 1980.

Ground dried whole mussels as acalcium supplement for chicken ration. Poult. Sci. , 59: 2356-2368. Appendices A. CURRICULUM VITAE Name: Iris Kaye L. Madrid Birthday: February 9, 1996 Address: San Andres, Cabatuan, Isabela Parents: Alexander S. Madrid Catherine L. Madrid Achievements: 1st year: Gold Medalist 2nd year: Silver Medalist 3rd year: Silver Medalist Name: Neil Renzo D. Agonoy Age: 15 Address: Malasin, San Mateo, Isabela Parents: Reynaldo C. Agonoy Melita D. Agonoy Achievements: 1st year: Bronze Medalist 2nd year: Bronze Medalist 3rd year: Bronze Medalist th year: Bronze Medalist Name: Alejandro D. Galera II Age: 16 Address: Salinungan West, San Mateo, Isabela Parents: Alejandro S. Galera Sr. Venus D. Galera Achievements: 1st year: Achiever 2nd year: Achiever 3rd year: Achiever 4th year: Achiever Name: Arvin Jon S. Acuna Age: 16 Address: Magsaysay, Alicia, Isabela Parents: Andy Francis G. Acuna Joselyn S. Acuna Achievements: 1st year: Bronze Medalist 2nd year: Achiever 3rd year: Achiever B. Pictorials

Washing of the chemical apparatus after formulating the treatments

Formulating the 4 treatments Weighing a sample treatment