Effect of Dried Rumen Content with and Without Cellulase in Diet on Carcass Quality of Broiler Chickens

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Abstract: The objective of the experiment was to assess the responses of broiler chicks to the inclusion of dried rumen content with and without cellulase on broiler diet. A total of 90 broiler chickens were used in this study. Broilers were randomly allotted to five dietary treatment groups and each treatment group was equally divided into three replicates. The dietary treatments were based diet (BD), 90% BD+10% Rumen Content (RC), 80% BD+20% RC, 90% BD+10% Rumen Content with Cellulase (RCC) (RC+0.5 g/kg cellulase), 80% BD+20% CRC, as R0, R1, R2, R3 and R4, respectively. The experiment terminated after 4 weeks at the age of 7 weeks, during which, feed intake, carcass yield, abdominal fat and blood cholesterol were measured. All experimental data were subjected to the analysis of variance test followed by orthogonal contrast test. Results showed that the daily feed intake of BD was significantly higher than RC and the RC was significantly higher than RCC, but no significant difference was observed between RCC 10 and 20%. Daily crude fibre intake of BD was significantly lower than RCC and RCC was significantly lower than RC. Carcass yield of BC was significantly higher than RC and RCC was significantly higher than RC and carcass yield was higher than RCC. Abdominal fat weight of RC was significantly lower than BD and RCC and the best abdominal fat weight was recorded in RC treatment. It can be concluded that rumen content without cellulase in diet could be acceptable for abdominal fat weight and rumen content incubated with cellulase could be acceptable up to 20% levels in broiler diets for carcass yield and blood cholesterol.

Key words: Broiler, carcass, cellulase, rumen content

INTRODUCTION
Rumen content is a material from the rumen of cattle which is the first stomach compartment of the ruminants. It is account for about 80% of the capacity of the adult ruminant stomach (Church, 1993). The bulk digestion of the rumen content is an important source of energy, protein and vitamins especially vitamin B complex (Adeniji and Jimoh, 2007). Agbabiaka et al. (2011) stated that rumen digesta is the partially digested forage mainly found in the rumen of ruminant animals and fairly rich in crude protein (18.52%). These waste materials, if properly treated can be useful for animals. The feedstuff is relatively cheap and it is a waste constituting disposal problem at the abattoir and it is locally available. Oladunjoye and Ojebyi (2010) stated that it is cheaper and locally available alternative agro-by products, especially those that have no nutritional value to mankind. In order to get the dried rumen contents, rumen contents are processed and solids are mechanically separated from the liquid, retaining the solids as animal feed. The dried rumen digesta obtained in this way not only serves as a feed nutrient, but also its recycling reduces disposal and environmental pollution problem (Swan, 1992). The dried rumen contents contain high fiber which tends to increase the total fiber content of the diet (Khan et al., 2014).

Poultry, like other monogastric animals, have little or no ability to digest high fibrous materials and this is one of the major problems in their utilization of agricultural wastes. Chickens do not possess enzymes like cellulase, hemicellulase, xylanase and phytase to digest components of cell wall of plant. It is therefore difficult and uneconomical to substitute completely. This rumen content is a fibrous feedstuff with 14.48% crude fibre (Adeniji and Jimoh, 2007). As Makinde et al. (2008) reported that dietary sun-dried rumen content-blood meal up to 10% was beneficial for growth performance and that total replacement of fishmeal was possible in broiler diets. Moreover, Has et al. (2013) stated that a decline in final body weight and digestibility of nutrients as long the increased use of mulberry leaves in broiler's feed, but rumen liquor fermentation treatments proven an improving digestibility of mulberry leave than unfermented treatments. Colette et al. (2013) reported that dried rumen content and castor oil seed cake diets were served to broiler birds in an attempt to determine their effects on haematological indices, serum biochemistry and organoleptic properties of the birds.
Chicken meat is an important segment of the consumption structure of various meat types as it is one of the favorite meat types. In addition, it is quick and easy to prepare, healthy, safe and nourishing (Vukasovic, 2011). Consumers do not cherish tissues of broilers with excessive lipid deposits (Alvarenga et al., 2011). In fact, they prefer meat with less fat (Thiruvenkadan et al., 2011). Consequently, poultry farmers and researchers have been trying several alternatives to enhance feed quality on meat production. Keeping in view the importance of rumen contents present study was planned to study the feasibility of using rumen content in broiler feed. The main objectives of the present study was to study on diets having varying levels of rumen contents with and without cellulase on carcass quality in broilers.

MATERIALS AND METHODS
Preparation of rumen content: Fresh rumen content obtained from the rumen of slaughtered cattle was processed with filter and solids are mechanically separated from the liquid, then the solids were sundried to constant weight for 3-5 days. Part of the solids then was ground to fine powder using mortar and pestle, then milled and mixed with cellulase to incubate on 48 hours. Chemical composition of rumen content and feedstuffs were determined using standard procedures of AOAC (1990) (Table 1 and 2).

Birds and feed: A total of 90 broiler chickens finisher CP 707 were used for this study which lasted for 4 weeks at the age of 7 weeks. The chicks were randomly allocated to five dietary treatment groups and each treatments had three replicates of six experimental birds. The dietary treatments were based diet (BD), 90% BD+10% RC, 80% BD+20% RC, 90% BD+10% RCC (RC+0.5 g/kg cellulase), 80% BD+20% RCC (RC+0.5 g/kg cellulase), as R0, R1, R2, R3 and R4 respectively. Based diet contain 55% yellow corn, 35% commercial diet, 9.5% rice bran and 0.5% Top Mix. Throughout the experiment, the birds were allowed to consume feed and water ad libitum and feed intake, carcass yield, abdominal fat and blood cholesterol were measured. Survivability was 100% for all of the treatments. On day 29 of the experiment, one representative bird from each pen was conventionally sacrificed by cervical dislocation technique, as described in the Report of the AVMA Panel on Euthanasia (AVMA, 2001) and its carcass parameters (ready to cook) including dressing percentage and abdominal fat were determined.

Statistical analysis: The data were subjected to analyze for a variance technique using completely randomized design (CRD) that was employed in one-way analysis of variance. The data were subjected to analyze for a variance technique using completely randomized design.
support productive performance of layers when compared to a diet without it. These results emphasize the quality of RCC as a good substitute to based diet of broiler for carcass yield.

The differences in dressed yield of broilers could be due to different diet, kind and level of enzyme used. This could be due to lower deposition of fat.

Deposits of fat in the abdominal region of the broiler are considered a rumen content with and without enzyme. Osei and Odoro (2000) reported that there were no differences in abdominal fat percentage due to enzyme treatment. These results emphasize the quality of RCC as a good substitute to based diet of broiler for abdominal fat weight.

**Conclusion:** It can be concluded that rumen content without cellulase in diet could be acceptable for abdominal fat weight and rumen content incubated with cellulase could be acceptable up to 20% levels in broiler diets for carcass yield and blood cholesterol.

**REFERENCES**


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