

BARBADOS GIANT AFRICAN SNAIL AS A COMPONENT OF COMMERCIAL BROILER FEED

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The Poultry Team (left to right: Marianne and Tamara)

Introduction

The Giant African Snail (GAS) has been a major issue throughout Barbados over the last few years. Therefore, the need to control the GAS population and/or find positive uses for it is important.

Recent communication with locals suggests that a natural decline in population may have occurred in the past few years. The large number of snails that the Bounty system collects may have been significant in contributing to this reduction. However, the large GAS population, in combination with its ability to multiply quickly, is present in significant numbers and represents a potentially valuable resource.

The incorporation of GAS meat into broiler feed may be a method to control the GAS population as well as a cost-saving method for feed production companies in Barbados and poultry farmers. The poultry industry is ranked the largest agricultural industry, in terms of value, in Barbados with a production of 14,934 MT of indigenous chicken meat in 2010. At present, poultry and egg producers around the world are faced with unprecedented increases in feed ingredient prices, due to increases in world corn and soybean prices, resulting in some of the highest manufactured feed prices ever experienced.

Therefore, finding new cost-saving methods for feed production is of central importance for these companies and the incorporation of GAS meat into broiler feed may be one of the potential cost-saving methods. Our experiment looked into the effects on the growth and taste of poultry due to the incorporation of snail meat in poultry feed.

Analysis of Snail Meal for Poultry Feed

The amount of each ingredient needed in the treatments that were being fed snail meat was determined by Mr. Adrian Yard from Robert's Manufacturing to be similar to the nutrient breakdown of the commercial feed based on the assumption that dry snail meal is approximately 60% protein. This year, we decided to replace a certain percentage of soybean with GAS meal as a protein source for poultry.

We ordered all our snails from the Barbados Ministry of Agriculture's Bounty system. After turning the snail meat into mash, we sent a sample to Dr. Mustafa and one to Mr. Yard to be analyzed at McGill University and the Barbados government laboratory, respectively.

	ASH	FAT	PROTEIN
Dr. Mustafa's analysis	5.45%	4.71%	58.29%
Mr. Yard's analysis	5.97%	4.10%	52.55%

Summer 2012's Nutrient Analyses of GAS

After we blended all the feeds together, we sent off a sample of each treatment to be analyzed by Dr. Mustafa. One treatment was regular poultry feed used in Barbados, the second had 50% soybean and 50% GAS meal as the protein source and the third had 100% GAS meal as the protein source.

	Treatment 1	Treatment 2	Treatment 3
Protein (%)	19.1	21	22.7
Ash (%)	3.9	3.67	3.52

Dr. Mustafa's Analysis of the Blended Treatment Feeds

Project Activities: Materials and Methods

Once we received the GAS from the Bounty system, we used the facilities at the University of the West Indies at Cave Hill to boil them and separate the meat from the shell. The meat was then placed in an oven at an average temperature of 60°C for a little over 24 hours and later blended into a mash.



Marianne separating snail meat from shell



Tamara blending the snail meat

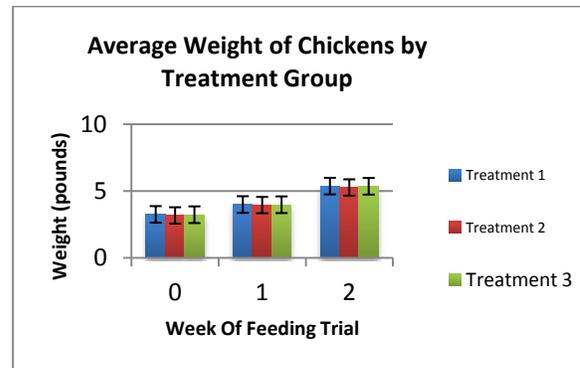
We then blended the regular poultry feed for treatment 1 to turn it into a mash. And then put all the ingredients together for treatments 2 and 3. And we were all set for the arrival of the chickens. A chicken coop was built for them by Mr. Rowe at Bellairs Research Institute.

The 15 chickens (5 in each treatment) were randomly placed in different cages. Initially, the base of the cages had sand, but this caused irritation in their feet, so after 1.5 weeks, we cleaned the entire chicken coop and replaced the sand with bagasse, which the chickens seemed to find more comfortable. They always had a constant supply of water and were fed twice a day. We had the chickens for 23 days in total, but the feeding trial itself lasted 2 weeks.

We also decided to write a mini-survey for a taste-test we held at the end of our experiment asking people to rate the sample of one chicken breast from each treatment from 1-5 (1 being unappetizing and 5 being delicious) and to rank the three different samples from 1-3 (1 being the favorite and 3 being the least favorite)

Findings

We weighed the chickens the morning we started them on the feed trial. We weighed them at the end of the first week and at the end of the last week, right before sending them off to a local butcher. As you see below, our findings suggest that the weight of the chickens in the three treatments were all the same, without any significant statistical differences.



Average Weight of Chickens by Treatment Group

We also held a BBQ at one of our mentor's home, Keith Laurie, where we held the taste-test. The samples were simply fried in butter, as to not disguise the taste of the actual meat. Results from the mini-survey showed a large number of people favoring the sample of chicken from the third treatment (fed 100% snail meal instead of soybean). Few were able to guess which sample had been fed commercial feed and which hadn't.



At the BBQ – From left to right: Marianne, Keith and Tamara
Incorporating the GAS Meal in Barbados

While GAS meal can be used to replace soybean, there is simply not enough GAS on the island to do so. From May 2011 to the present, the Bounty system collected 145.621 tons of GAS while the required amount to fully replace soybean in poultry feed would be 2000 tons/month at Pinnacle Feeds.

Another major issue is the Barbados population's overall hatred of the GAS. After speaking to numerous locals about eating chickens that were fed snails, the overall public consensus was a look of utter disgust and unwillingness to eat such chickens. While for some, this hatred stems from their religious background (primarily based on the teachings found in the Book of Leviticus), for others, the GAS is simply an aesthetic nuisance.

Others have major concerns over the potential of the snail to act as a vector for the nematode *Angiostrongylus cantonensis*, which causes eosinophilic meningoencephalitis in humans. For the latter concern, there has been no evidence so far to suggest that this nematode is found in Barbados. However, the concern still exists as a major reason for the overall disgust of the GAS.

To convince a population, with such strong opinions against the digestion of the GAS, to eat chickens which are fed poultry feed that contain GAS seems to be impossible to do in the near future.

Recommendations

Finally, soybean is actually fully utilized at Pinnacle Feeds. They use the soybean oil to produce margarine and oil and use the residue as an ingredient for feed. Robert's Mill

Company actually started simply as a margarine and oil manufacturer and expanded to own Pinnacle Feeds and produce animal feed. This allowed them to make use of the soybean residue, which is a sustainable choice.

A major issue remains with the increasing price of corn in the world market. Now that Barbados' major importer, the US, is using corn as a source of ethanol, corn prices will continue to rise. We believe more focus must be placed on finding local substitutes for corn, such as cassava or sorghum, in poultry feed in Barbados since the poultry market will always remain the largest market in Barbados.

We have shown that the replacement of an imported product such as soybean by a local product did not change the overall taste or health of the poultry. Therefore, it is possible to utilize local products in poultry feed, effectively lowering the feed cost as well as increasing food sovereignty in Barbados.



Marianne and Tamara with the Chickens at the Bellairs Research Institute of McGill University in St. James, Barbados

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