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Effect of Feeding Graded Level of Decomposed Rumen Content to Snails

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Abstract - The effect of graded level of rumen content fed to ninety growing snail, *Achatina Achatina* was investigated in a ten week experiment. Complete randomised designed (CRD) was used in which snails were assigned to three dietary treatment groups 10%,15% and 20% decomposed rumen content respectively, each treatment had three replicates with ten snails per replicate. The snails were fed ad-libitum. Growth parameter (weight Gain, feed intake feed to gain ratio) were taken on weekly basis. snail fed 10% decomposed rumen Content recorded the highest weight gain ($p < 0.05$) while those fed 20% decomposed rumen content recorded the least value of weight gain though there were no significant difference between those feed containing 15% and 20% rumen content ($P > 0.05$). Feed intake of those fed 10% rumen content was significantly higher ($P < 0.05$) than the other two feed samples. there was no significant difference among the three feed samples in terms of feed to gain ratio. The result shows that there is higher growth performance in snails fed 10% rumen content.

Keywords : *Rumen content, Achatina achatina, Growth parameter, feed.*

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I. INTRODUCTION

As a result of continuous increase in growth of Nigerian population, then the demand for animal protein became very acute. This increase in demand of proteineous food made the price to increase since the supply cannot meet the ever increasing demand .It is therefore necessary for man to look for a cheaper source of animal protein and that is why snailry comes in focus, Snailry refers to rearing and management of edible snails. The increase desire to develop affordable and acceptable proteineous food for our local resources to prevent proteineous malnutrition in Nigeria economy has led to the consumption of snail, a gastropods mollusc which is meat from sources other than beef, poultry, mutton, goat meat and fish. snail meat has become popular culinary in various household(Ajayi et al 1978).The cost of convectional proteineous food is on high side, so there is need to explore the non-convectional one like snail meat, in order to increase protein supply. Also when poultry meat consumption has fallen in many countries as a result of highly pathogenic avian influenza (HPAI), snailry and other micro livestock should be given adequate attention.

Snail are highly appreciated in many countries for its high nutritive and medicinal values (Cobbinal1993, Akinnusi1998), the material used in feeding snail are not in competition with man since man do not consume most of these materials. In animal production about 50-80% of total cost of production is on feeding these animals (Adams and Tewe 1996).So many attention has been made to use non convectional ingredients like leaves, peels of cassava (Akinfala et al., 2000, Tewe1982).

The process of raising snail is heliciculture, if heliciculture is to be practised on large scale then it requires considerable investment in time requirement and resources. Heliciculture has various alternative system of production with different handling and feeding options. Extensive heliciculture is characterised by low technification level and these support feed on green vegetable while its intensive system is with high level of technification and compounded feed are used in feeding them. Feeding snail with green vegetable do not provide adequate growth rate when compared to commercial snail breeding (Daguzan 1981.)

Snail gradually emerge as domestic micro livestock of importance in Nigeria .Snail farming is now been practised as hobby by individual farmer, while commercial large venture are expected to spring up when people eventually come to appreciate the advantage of snail farming which is high returns on investment with low inputs.

Research has shown that exposure of snail to continuous light at night increased their activity and rate of food consumption and this promote their rapid growth. Though there feeding is sporadic, interspersed with exploratory movement , so less food will be consumed at normal darkness hour

Many author described snail as herbivores, that can feed on wide range of food items (Ajayi et al., 1978, Akinwumi 1998 and Conbbinal 1990).Then feed on rotten plants & animal matter, green leaves, fruits, tubers and flower when they are on wild but do well when fed with compounded feed in the intensive .Phillips 1992 ranked pawpaw leaves as best snail compared with other plant parts. Maize chaff has higher potentials for use as energy supplement than sweet potatoes, cocoyam, and cassava (Omole et al., 1998). The result of these experiments was carried out by Hamzat et al., 2002, When formulating snail feed. The calcium and protein content of the feed must be made a little higher.

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The calcium will assist in shell growth and extension while the protein will assist in flesh growth. Some researcher uses chicken mash feed as snail mash. Commercial chicken feed is around 16% to 17% protein. The fish meal or meat meal some of the mash contain made it good for growing snail (Iglesias, j castillejo 1990).supplying mash to hatching might reduce cannibalism. The feed that snail like and that promote growth are broiler finisher, layer mash .Rabbit pellet is not very good for snail as they do not perform well mash is generally better for growing snail and old snail because they will grow faster.

When snail mash is mixed with 10% sand, they last for some time and do not cause offence and the snail will perform better.

The variation of dry matter, rate of protein intake, growth rate, growth efficiency factor and protein retention rate depend on dietary protein content and the age of the animal, is in agreement with what happens in other animals Sanz-sampelayo, M.R. Fonolla.J. And Extremera F.G thereof (1991).These result suggest that there is no need to use diet with more than 17.5% crude protein in feeding snail.

II. MATERIAL AND METHODS

a) Animals

Ninety growing *Achatina achatina* with mean weight ranging from 120g-160g were obtained from Ede town in Osun State Nigeria.

b) Rumen Content

Rumen content were collected from ipata market and was dumped on the ground for five days so that maggot can grow on it, it was later boiled so that microorganism in it is killed and then sun dried to about 8% moisture content .After which it was milled into powder form so that it can be well included in the feed for animals.

c) Diet

Entire ninety snails were subjected to cafeteria feeding for two weeks before the commencement of the experiment, this will allow the snail to have a wide range of feed from any of the treatments available for the experiment at same time so that the snail can select and feed on any feed sample that is acceptable to them.

there are six feed containing decomposed rumen content at 10%,15%,20%,25%,30%,35% respectively.it was observed that feed containing 25%,30%,35% was completely rejected by snails while those of 10%,15% and 20% rumen content were fed on at different rate.it was also observed that the more the decomposed rumen content the less they consume the feed

d) Experimental Design

A complete block design (CRD) was used for the experiment, the trial comprise of three treatment, those feed containing 10%,15% and 20% decomposed rumen content. Each treatment has three replicate containing ten snails each making thirty snails per treatment. The feed trial lasted for ten weeks.

e) Management And Rearing Methods

The snail were reared in a concrete compartment and the bottom of the pen was filled with Moist sandy loam soil to depth of 15cm and the top was covered with mosquitoes net and re enforced with wire netting for aeration. Snail is nocturnal animals because they are active at night, so the feeding and other management practise is restricted till evening. snail were fed once a day at about between 5-6pm because they are also nocturnal feeder ,the next day, the remnant is removed and replaced with fresh mash ,water is also supply in a flat plastic plate same used in saving the mash,they were fed ad-libitum throughout the period of the experiment. The environment is watered to make moist soil

f) Measurment

Feed intake was taken on daily basis by subtracting the ruminant from the feed served. Data were collected on weekly basis and the body weight, growth rate, feed conversion ratio, and daily feed intake. There was no mortality throughout the period of the experiment.

g) Stastical Analysis

The result obtained were analysed using analysis of variance (ANOVA) sources of variation were treatment, block and error Duncan multiple range test (Steel and Torrie,1980) was used to separate significant different among mean.

III. RESULTS AND DISCUSSION

Table 1 : Feed intake /Snail/day (g)

	Week1	Week2	Week3	Week4	Week5	Week6	Week7	Week8	Week9	Week10
10%	13.25	14.30	15.77	18.66	20.92	19.80	17.73	18.93	19.83	21.16
15%	12.43	13.30	13.83	17.60	19.58	17.74	16.40	16.25	18.50	16.70
20%	8.80	9.74	7.74	9.57	8.60	7.11	7.46	7.96	9.62	7.72

Table 2 : Weight gain/snail/week (g)

10%	10.76	12.56	7.80	14.80	4.50	6.56	2.70	3.16	3.00	3.90
15%	4.76	9.46	10.10	3.26	3.10	1.00	1.43	5.00	2.03	1.70
20%	2.43	1.63	1.80	3.93	12.20	4.50	1.40	1.90	1.90	1.20

Table 3 : Body weight /Snail/week (g)

Initia	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	
10%	167.0	177.7	190.3	198.1	212.9	217.4	224.0	226.7	229.8	232.8	236.7
15%	166.8	171.6	181.0	191.1	194.4	197.5	198.5	199.9	204.9	207.0	208.7
20%	166.2	168.6	170.3	230.3	175.9	188.1	192.6	194.0	194.2	197.8	199.0

Table 4 : Feed/gain ratio/snail/week(g)

Wk1	Wk2	Wk3	Wk4	Wk5	Wk6	Wk7	Wk8	Wk9	Wk10	
10%	1.35	1.16	2.42	1.32	16.09	3.1	6.58	6.36	6.76	5.59
15%	3.0	1.45	1.36	8.4	12.9	14.47	14.13	3.5	11.5	12.17
20%	5.61	7.9	17.54	2.94	0.86	1.64	8.23	4.8	6.08	7.15

Performance Characteristic Of Snail Fed Graded Level Of Rumen Content

	10%	15%	20%
Initial body wt	167.00a	166.80b	166.20c
Final body wt	236.70a	208.70b	199.00c
Actual body wt	69.7a	41.9c	32.8b
Feed intake(g/snail/day)	7.05a	5.56b	2.57c
Feed/gain ratio	3.73a	4.16b	8.61c

Treatment means in same row follow by same subscript are not significantly different $P > 0.05$

The observation made in the study shows that snail fed mainly at night irrespective of the time their feed was presented to them. Before feeding, snail explore feed with their tentacles before they protrude their lips to test the feed. All the experimental diets were received and were eaten at different rates.

Table 4.1 shows the performance characteristics of snail fed graded level of decomposed rumen content, it was found that the feed with 10% rumen content was consumed most while those feed with 15% rumen content was consumed more and the feed with 20% rumen content was consumed least. There was no significant difference between feeds 10% and 15% ($P > 0.05$) but there was a significant difference when the two feeds were compared to that feed containing 20% decomposed rumen content ($P < 0.05$).

There was appreciable weight gain in feed consumed in 10% rumen content ($P < 0.05$) when compared with those feeds 15% and 20% decomposed rumen content that has no significant difference between themselves ($P < 0.05$). There was no significant difference in feed to gain ratio for all the feeds used in the experiment.

IV. DISCUSSION

The result of the study showed that snail feed only at night between 10pm and 1am even though the diet was presented earlier. The observation agreed with the finding of Amusan and Omidiji (1998) and Akinnusi

(2002). Feeding was preceded by diet exploration of diet by snail with their tentacle and lips, which is an indication that snail depend on olfactory and gustatory cues to explore their environment by ingestion of food (south1992).

The highest feed consumed by snail (10% decomposed rumen content feed) was as a result of low fibre content in the feed when compared to other feed samples of 15% and 20% rumen content (Omole et al., 1990). snail cannot digest feed containing very high fibre content.

The appreciable weight gain obtained in 10% rumen content feed was as a result of high rate with which the feed was consumed when compared with other feed. The feed consumed is then converted to flesh because of low fibre content it contained when compared with other feed samples containing 15% and 20% decomposed rumen content which was consumed in less quantity and hence less feed to flesh conversion was obtained from them.

V. CONCLUSION

The experiment was designed to investigate the effect of graded level of decomposed rumen content on the performance characteristics of growing snail (*Achatina achatina*). The result shows that better performance was obtained with those that fed on 10% rumen content. Based on the result, it could be recommended that

- 1) Snail farmer should be encouraged to adopt formulated feed so as to enhance the performance of the snails
- 2) The use of rumen content on other types of animals could be tried because of the protein contained in decomposed rumen content, this is because feeding animals is a major problem to farmers as most of the available ingredients are in serious competition between man and animals and that's why feeding alone took about 60%-80% of the total cost of raising farm animals

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