

# **C**OMPARATIVE STUDY ON GROWTH PERFORMANCE OF GUINEA PIG (*Cavia porcellus*) USING PROCESSED AND LOCAL FEEDS

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## **ABSTRACT**

**A** research conducted on the growth performance of guinea pig (*Cavia porcellus*) using processed and local feeds was carried out to compare the effect of feeding pattern and growth performance of *C. porcellus* under laboratory condition. A total number of 9 guinea pigs (*C. porcellus*) were obtained from Lokuwa behind prison yard Mubi and were divided into 3 groups of 3 each which were used for this study. The results showed that there is increased in body weight and body length of the *C. porcellus* for those that were fed with processed feeds group "a" while there was decreased in body weight of *C. porcellus* that were fed with local feeds group "b" and those in group "c" (control group) showed a rapid increase in the body weight and length of the *C. porcellus* that were fed with both the processed and local feeds. The body weight of *C. porcellus* increased from 298.0 g to 650.0g and statistically there is a significant difference ( $p < 0.05$ ) of the

## **Introduction:**

The guinea pig was first domesticated as early as 5000 BC for food by Andean, region of South America, Spanish, Dutch, English traders brought guinea pigs to Europe, where they quickly become popular as exotic pets among the upper classes and royalty including Queen Elizabeth (Chazan, 2008).

The earliest known written account of the guinea pig dates from 1547, in description of the animal from Santo Domingo, because guinea pigs are not native to Hispaniola, it was earlier believed that the animal was introduced by travellers. However based on more recent excavations on West Indian Island it has

body weight and length of *C. porcellus* under laboratory condition. the length of *C. porcellus* increased from 22.0cm to 26.0cm and the statistical mean of the length was  $\pm 23.74$  and there is a significant difference at ( $p < 0.05$ ) of the body weight and length of *C. porcellus* under laboratory condition. Therefore, it is recommended that both the processed and local feeds should be used to feed the *C. porcellus*.

**Keywords:** Guinea pig, (*Cavia porcellus*), Processed, Local Feeds, Growth performance, Mubi

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become known that the animal must have been introduced by ceramic-making horticulturalists from South America to the Caribbean, the guinea pig was first described in the west in 1554 by the Swiss naturalist Conrad Gessner. (Gmelig, 1977).

The Guinea pig *Cavia porcellus* also called the cavy is a species of rodent. The earlier studies based in biochemistry and hybridization suggested that they are domesticated descendants of closely related species of cavy such as *Cavia aperea*, *cavia fulgida* or *cavia tschudii* and therefore, they do not exist naturally in the wild, (Gmelig, *et al*, 1977). Some species of cavy identified in the 20th century, such as *Cavia anoloimae* and *Cavia guinnae* may be domesticated Guinea pig. (Nowak, *et al*, 1999; Noguira and Mendes 2016).

Fruit and vegetables is the Guinea pig natural diet, their molars are particularly suited for grinding plant matter and grow continuously throughout the animals life. Most grass eating Mammals are quite large and have a long digestive tract, while guinea pigs have much longer colons than most rodents. Guinea pigs cannot synthesize their own vitamin C and most obtain this vital nutrient from food, guinea pigs do not ingest enough vitamin C, and they can suffer from potentially fatal scurvy. Guinea pig require about 10mg of vitamin C daily which can be obtained through fresh, raw fruits and vegetables such as spinach, carrot, cabbage and apple or through dietary supplements, also they tends to be fickle eaters when it comes to fruits and vegetables, having learned early in life, because their habits are difficult to change after maturity. (Richardson, 2000; Balsiger *et*

al.2017). In view of the scarcity or rare information on the comparative study of the growth performance on modern and local feeds of Guinea pig (*C. porcellus*) under laboratory conditions, a research of this nature was embarked open to compare the effect of feeding pattern and the growth performance and weight of *C. porcellus* under laboratory conditions using different feeds.

## MATERIALS AND METHODS

**Sampling:** A total number of 9 guinea pigs (*Cavia porcellus*) were obtained from Lokuwa behind prison yard Mubi North Local Government Area of Adamawa State, Nigeria and were divided into 3 groups of 3 each which were used for this study, under laboratory condition.

**Experimental Design:** The different *Cavia porcellus* groups were housed in wood, wire mesh cage at normal room temperature, normal body temperature, and so it's ideal ambient air temperature which range about 36-38°C. The initial weight of each Guinea pig was weighed before commencement of the experiment and also it was weighed after the experiment and the result was recorded, the initial growth performance of each Guinea pig (*Cavia porcellus*) was determined before and after the experiment and the result was recorded. Group of Guinea pigs were placed on 1 00 grams of standard diet of feeding patterns, while the control group was fed and watered appropriately. Group A was fed and watered at 4 hours interval, the same procedure was applied in group B, which was fed and watered also at 4 hours interval and group C serve as control, the experiment lasted for six weeks.

**Weight Analysis:** The weights of the guinea pigs were obtained before, during and after the experiment and the results were recorded as in Ferreira *et al.* (2012). They were weighed six (6) times with the interval of one week during the experiment.

**Growth Performance Analysis:** The determination of growth performance of each guinea pig (*Cavia porcellus*), was checked and the length was measured accurately before, during and after the experiment as in Ferreira *et al.* (2012) and the result was recorded at the end of the experiment.

**Feeding Pattern Analysis:** The different feeding patterns of the guinea pig (*Cavia porcellus*) was properly checked and observed from the first day to the last day of the experiment and the appropriate result was recorded, at the end of the experiment, following the method of Aldrigui *et al.* (2016)

**Modern Feed:** Processed feed sample was bought from the commercial animal feeds and fed group A of the *Cavia porcellus* appropriately by duly considering the specific time for the feeding procedure without missing the time they were supposed to fed and recorded the performance of their growth as in Aldrigui *et al.* (2016)

**Local Feeds:** The method of Aldrigui *et al.* (2016) was adopted; samples of grass hay was collected in the wild and feed group B of the *Cavia porcellus* at the appropriate time intervals. The time of feeding was considered and the growth performance was also recorded at the end of the experiment.

## RESULTS

There was an increase in body weight with little increased body length of *C. porcellus* for those that were experimentally fed with processed feeds (modern feeds) that is group A and there was decrease in body weight for those that were fed with only local feeds group B, While there was a rapid increase in both body weight and length for those under control group (group C) which were fed with both local and processed feeds. The results were presented in tables 1 to 6

### 1: The body weight in grams of *Cavia porcelus* using modern (processed) feeds for 4 weeks (Group A).

Weeks	Body weight in grams		
	A1	A2	A3
Initial weight	327.8g	394.6g	449.0g
1 <sup>st</sup> week	350.5g	452.2g	466.3g
2 <sup>nd</sup> week	380.3g	465.0g	488.1g
3 <sup>rd</sup> week	415.8g	479.5g	496.7g
4 <sup>th</sup> week	452.3g	491.5g	509.7g
End of experiment	467.3g	510.2g	528.7g

P < 0.05

In table 1, it shows an increase weight based on the processed feed been administered to the group A, where A1 has weighed 327.8g, after one week it increased with 22.7g, after another one week it increased with 29.8g the same thing happened in A2 and A3 they increased gradually.

**Table 2: The body weight in grams of *Cavia porcellus* using local feeds for 4 weeks (Group B).**

Weeks	Body weight in grams		
	B1	B2	B3
Initial weight	344.6g	452.8g	549.lg
1 <sup>st</sup> week	323.6g	378.8g	549.lg
2 <sup>nd</sup> week	315.lg	365.9g	466.3g
3 <sup>rd</sup> week	308.5g	346.9g	405.9g
4 <sup>th</sup> week	297.6g	320.lg	395.0g
End of experiment	315.lg	331.9g	399.8g

P < 0.05

There was decrease in body weight in table 2 that is *C. porcellus* that has been administered local feeds, with the following grams, B1 has 344.6g as initial weight and after one week it decreased with 21.0g and after another one week it decreased with 8.5g.

B<sub>2</sub> has 452.8g as initial weight and after one week it decreased with 74.0g, and after another one week it decreased with 12.9g.

B<sub>3</sub> has 549.lg as initial weight and after one week it decreased with 48.7g and after another one week it decreased with 34.lg.

**Table 3: The body weight in grams of *Cavia porcellus* under experimental group C (control) for 4 weeks.**

Weeks	Body weight in grams		
	C1	C2	C3
Initial weight	418.4g	483.5g	500.4g
1 <sup>st</sup> week	478.0g	534.lg	545.7g
2 <sup>nd</sup> week	537.5g	549.4g	579.5g

3 <sup>rd</sup> week	572.9g	574.7g	616.7g
4 <sup>th</sup> week	599.2g	591.8g	635.3g
End of experiment	625.6g	619.4g	650.2g

$P < 0.05$

In table 3, it shows a rapid increase in body weight for those that were been administered both feeds (local feeds and processed feeds) which is the control group (group C), where C<sub>1</sub> was weighed about 418.4g, after one week it increased with 59.6g, and after another one week it increased with 59.5g, this also implies in C<sub>2</sub> and C<sub>3</sub>.

**Table 4: The length (cm) of *Cavia porcellus* for 4 weeks using modern (processed) feeds.**

Weeks	Body length cm		
	A1	A2	A3
Initial weight	22cm	23.5cm	24cm
1 <sup>st</sup> week	22cm	23.5cm	24cm
2 <sup>nd</sup> week	22cm	23.5cm	24cm
3 <sup>rd</sup> week	23cm	24cm	24cm
4 <sup>th</sup> week	24cm	25cm	25cm
End of experiment	25cm	26cm	26cm

$P < 0.05$

Table 4, shows significant difference in length based on the feeds administered to the group.

**Table 5: The length (cm) of *Cavia porcellus* for 4 weeks using local feeds**

Weeks	Body length cm		
	B1	B2	B3
Initial weight	22cm	23cm	23cm
1 <sup>st</sup> week	22cm	23cm	23cm
2 <sup>nd</sup> week	22cm	23cm	23cm
3 <sup>rd</sup> week	22cm	23cm	23cm
4 <sup>th</sup> week	22cm	23cm	23cm
End of experiment	23cm	23cm	24cm

$P < 0.05$

Table 5 shows no significant difference in length based on the feeds administered to the group.

**Table 6: The length (cm) of *Cavia porcellus* for 4 weeks using control feeds.**

Weeks	Body length cm		
	C1	C2	C3
Initial weight	24cm	23cm	24cm
1 <sup>st</sup> week	24cm	24cm	24cm
2 <sup>nd</sup> week	24cm	24cm	24cm
3 <sup>rd</sup> week	24cm	24cm	24cm
4 <sup>th</sup> week	25cm	25cm	25cm
End of experiment	26cm	26cm	26cm

$P < 0.05$

Table 6, shows a significant difference in length based on the feeds administered.

#### Key:

- A<sub>1</sub> — The first *Cavia porcellus* in group A
- A<sub>2</sub> — The second *Cavia porcellus* in group A
- A<sub>3</sub> — The third *Cavia porcellus* in group A
- B<sub>1</sub> — The first *Cavia porcellus* in group B
- B<sub>2</sub> — The second *Cavia porcellus* in group B
- B<sub>3</sub> — The third *Cavia porcellus* in group B
- C<sub>1</sub> — The first *cavia porcellus* in group C
- C<sub>2</sub> — The second *cavia porcellus* in group C
- C<sub>3</sub> — The third *cavia porcellus* in group C

#### DISCUSSION

In the three groups of the *Cavia porcellus* in this study there was a rapid increase in both body weight and length in group C (control group) which were fed and watered with both processed and local feed compared to other groups (group A and B) which went through different patterns.

There was a significant difference at ( $P < 0.05$ ) of the growth performance between the control group (group C) and the other groups (group A and B). This is in line with the finding of Fashakin, (1993), who reported that the amount of different feeds consumed by animals influence their growth performance.

The group A, that were administered with processed feeds increased in weight and length which agree with Lake, (2007) who reported that *Cavia porcellus* preferred processed feed than grass hay. The group B of *Cavia porcellus* that were administered with local feeds shows a decreased in weight and is in line with (Richardson, 2000) who stated that *Cavia porcellus* tend to be fickle eaters when it comes to grass hay, they can starve rather than accepting some grass hay under captive.

The group C of *Cavia porcellus* that serve as control group, that were administered with both the feeds, shows a great increase in both weight and length. This may be because they are at liberty and have a choice of feeds any one they feel like eating as in the report of (Richardson, 2000) that a constant supply of grass hay or other feeds help in the growth performance of *Cavia porcellus* in both the feed they can obtain vital nutrient.

## CONCLUSION AND RECOMMENDATIONS

In conclusion, for this period of six weeks of study, it was observed that *Cavia porcellus* in captive preferred mixed feeds (processed and local feeds) as shown by their increased in body weight and length. This might be due to the fact that they are at liberty and have a choice of feeds they feel like eating. Followed by group A those that were fed with the processed (modern) feeds, it also show an increase in body weight of the *Cavia porcellus*. The least preferred feeds was found to be grass hay (local feeds) which shows a great decreased in body weight of the *Cavia porcellus* and no increase nor decrease in body length.

Based on this study, the researcher therefore gives the following recommendations:



Both the processed feeds and the local feeds should be administered to the *Cavia porcellus* in order to obtain more nutrients for the growth performance.

Further study should be carried out on the comparative study on the reproductive performance of *Cavia porcellus* using processed (modern) and the local feeds.

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