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EDITORIAL

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We are grateful to the contributors and hope that our readers will enjoy reading these contributions.

Prof. Josephine N. Okoli
Editor-in-Chief

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EFFECT OF COMPOUNDED FEED ON BUNAJI CATTLE WEIGHT GAIN

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Abstract

The study investigated the effectiveness of compounded feed on bunaji cattle weight gain. Quasi-experimental design with pre-test and post-test group was used. The population comprised of all Bunaji calves present at Gariki market. The researchers made use of purposive sampling techniques to select Bunaji (white fulani) cattle because of its superiority in resisting diseases and it is commonly sold at Gariki market Amansea in Awka North Local Government Area of Anambra State. Different Herders of Bunaji cattle were assigned to experimental and control groups. The number of Bunaji cattle in each herder group put together constituted the sample size. This is to maintain the intactness of the group. The researchers made use of focus groups like herders, veterinary doctors, farm record books, observation and hanging digital weighing scale for administering of instrument. Observations, farm record books and hanging digital weighing scale was used for data collection. The reliability of the instrument was determined using test-retest method outside the research sample area. The reliability index 0.78 were obtained. Data were analyzed using mean weight of each cattle at every intervals of 4weeks (one month) for 28 and 31 weeks (7months). The findings revealed among others that cattle in the experimental had more mean weight gain of 608.04 to cattle in control groups with mean weight gain of 52.73. Based on the findings, the study recommended that awareness creation to herders on the relevance of calves feeding on local feed for fast weight gain.

Keywords: Compounded Feed, weight gain

Introduction

Conflicts between farmers and herders in Nigeria can be understood as a problem of access to land for pastures. This can be attributed to globalization, development, deteriorating environmental conditions, desertification, soil degradation and increasing complexity of innovations in science and technology. The problem affects pastoral farmers and crop commercial farmers for local consumption, export and agricultural bye products for industrial use. Okekeokosisi (2012) stressed on the need to introduce innovative ideas and skills that can improve agricultural productivity, export of products, produce productive citizens, increase unity and oneness in our country Nigeria. The science that deals with food, fibre production and processing can be called agriculture. Brit (2024) defined agriculture as the technologies of soil cultivation, crop cultivation and harvesting, animal production and the processing of plant and animal products for human consumption, export and for industry. It can also be said to be the processes of cultivating desirable plants and breeding and raising livestock for commercial purposes. According statistics as released in 2017, Nigeria had approximately over 80 million poultry farming, 76 million goats, 43.4 million sheep, 18.4 million cattle, 7.5 million pigs and 1.4 million of its equivalent. Still on statistics, livestock farming is about 5% of Nigeria's gross domestic product and 17% of its agricultural gross domestic product (Wikipedia, 2024). The 5% and 17% livestock and agricultural products contribute the nation's gross indigenous production (GIP) has a great decline from 2023 to the second quarter of 2024 as published in European Union (EU) website on 6th march, 2024. The decrease in GIP in Nigerian economy can be linked with high rate of unemployment, low consumer spending, low purchasing power and conflicts among farmers and herders in geo-political zones where pasture lands or routes for grazing were discovered by herders. Hence, the need for innovative production of local made feeds for grazing animals like cattle is needed to improve Nigerian GIP, re-unite our country and bring back investors.

Local made feed production (compounding of feed) for cattle is said to be prerequisite for enterprise profitability, weight and growth. It is the process of producing animal feed from raw domesticated agricultural products. The raw domesticated agricultural products to be used in compounding of feed locally stimulated the chromosomes for fast maturity, productivity and increase in weight lacks during pastoral farming. This pasture rearing of cattle brings spread of diseases, reduces fast productivity of ruminant animals and causes clash within the religions they operate. The study made use of

compounded feed with green grasses, medical plants, residue from crops and local extracted vitamins from maggot in Ngwo plant.

Feed compounding are made for livestock's. Livestock are the domesticated animals raised in an agricultural setting in order to provide labour and produce diversified products for consumption, usage for agriculture and for industry. Korsheva and Chaunina (2020) defined livestock as being the main branch of the agricultural industry, determines the state of the domestic market, the level of consumption of high-grade food products and food security. It is an easy to care animal that has a lots of by-products depending on the famers' immediate need and society at large. The volume of production of livestock products, including cattle, should be increased by feeding cattle with high-quality feeds that would boost the chromosomes.

High-quality feeds are feeds that retains its nutritional value and visual appearance from the day it is harvested until the day it is consumed. It is feed that is rich in essential nutrients and plays a crucial role in enhancing the growth, increase in weight, reproduction and overall health of livestock (Baris & History, 2023). Feeds are said to be of quality when they are produced on the basis of animals' different growth stages, different physiological requirements and different production uses, as well as the experiment and research on the evaluation of feed nutrition value, and according to the scientific formula used by the researchers. The researchers' made use of compounded feed for cattle rearing.

Compounded feed is mixtures of feed materials, oral animal feeding in the form of complete or complementary feedstuffs. It is a fully balanced product that contains vitamins, trace elements and other biologically active substances that ensure the healthy development of animals (Berger, Guettier, Urvoix, Bernard, Ganier, Chahnamian, Bihan-Duval, Mignon-grasteau, 2021). Faq (2024) stressed that compounded feeds are produced on scarcity of materials and reduction of cost for commercial farmers. There are a lot of research works on compounded feeds like that of grass cutter and poultry birds. Such works like Korsheva and Chaunina (2021) found that compound feed had a positive effect on the viability of broilers, there were no deaths during the period under study. According to the control slaughter results, it was found that the pre-slaughter live weight was higher by 35% in the experimental group. The weight of edible parts increased by 6%. The improved compound feed can be used both in industrial conditions and by poultry farms. The stated findings were contrary to the findings of Al-Mutairi, Al-Zahrani & Qassem (2023) that 37.1% noticed several

problems, including: changing the color of the meat, disease, problems in milk production, diarrhea, and abscesses. ...etc.) when using compound feed. This study were not conducted in Nigeria rather at Saudi Arabia and not in Bunaji cattle. Hence, this study seeks to examine Bunaji cattle feed with compounded feed and both groups of animals are stabilized to check their health status.

Furthermore, research conducted by Okeke (2020) on performance of Grasscutters (Thryonomys Swinderianus) fed with varying composition of compounded feed in Imo State for six months had highest percentage because of millet used as its concentrates. Such study was not conducted in cattle and the present study made use of residue from grains and crops in other to reduce cost and to predict high fast growth, increase in weight and fattening / maturity.

Feed intake theory was developed by Emmans between the years 1981 -1989. The theory states that birds - animals attempts to grow at their genetic potential, which would imply that they would attempt to eat as much of a given feed as would be necessary to grow at that rate. Emmans' theory further outlined the factors that can affect feed intake of animals. Such factors are; environmental conditions, state of the animal, nutritional and physical factors such as gut capacity and intake regulation. The bases of feed intake theory is for body weight gain, milk production, lean tissue accretion as well as reproductive functions, bone development and eggshell quality. This entails that feed composition is for improvement on animal nutrient and stimulation of chromosomes. Hence, the application of this theory on this study facilitates rapid growth, increase in weight, fattening or maturity of Bunaji cattle within 28 weeks (7months).

Statement of the Problem

Pastoral farming is a form of farming that is focused on the raising of animals. Animals raised by pastoral farming are cattle, sheep, goat and so on. Pastoral farmers need vast tracts of land in order for their animals to have enough grazing space. Thus, poor growth of cattle, deteriorating environmental conditions and soil degradation have led Fulani herdsmen from Northern Nigeria to change their transhumance routes for access to land for pasture and watering points. This problem gave the idea of extensive system of farming using three geo-political zones of Nigeria in which pastoral farming is occurring by herders. The geo-political zones are North central (Niger, Nasarawa, Kwara, Kogi, Benue, Plateau and FCT), South- east (Anambra, Abia, Enugu, Ebonyi,

Imo State) and South-south (Edo, Delta, Cross-River, Akwaibom, Rivers and Bayelsa State). The change in rout to these geo-political areas brought about herds-farmers clash, disunity, insecurity of lives, properties, insecurity of food, high price of commodities, high rate of unemployment, internally displaced persons (IDP) camps and other social vices. Thus, the study sought to investigate the effect of compounded feed for cattle weight gain.

Purpose of the Study

The goal of compounded feed is to encourage fast growth, fatting of cattle, provide employment, encourage skill development, small scale industries, curb-out herders farmers clash, improve food security, sustain lives and properties, provide economical, palatable and nutritional adequate diet to promote optimal growth, health and productivity of cattle. Specifically, the study seeks to;

1. Determine Mean weight of Bunaji cattle fed with compounded feed and those fed through nomadic herding.

Research Question

The study sought to provide answers to;

1. What are the mean weight of Bunaji cattle fed with compounded feed and those fed through nomadic herding.

Methodology

The study employed quasi-experimental research design involving pretest and post-test. In quasi-experimental research, it proves or disproves a cause and effect relationship between two variables as stipulated by Nworgu (2015). The study involved a control group (calves fed through pastoral farming and experimental group calves (fed with compounded feed). The study was carried out at Gariki Amansea in Awka North Local Government Area of Anambra State. All Bunaji calves present at Gariki market constituted the population. The researchers made use of purposive sampling techniques to select Bunaji (white fulani) cattle because of its superiority in resisting diseases and its commonly sold at Gariki market Amansea. Different herders of Bunaji cattle were assigned to experimental and control groups. The number of Bunaji cattle in each herder group put together constituted the sample size. This is to maintain the intactness of the group. Selected calve were randomly assigned to experimental and

control groups. The researchers studied how compounded feed could improve fast growth and increase in weight of calves. Pastures around the area, calves belonging to farmers, shelters provided for cattle by the government, compounded feed and farm record books was used for materials - instruments for data collection.

Thus, the pastures are green grasses and streams situated within the area of the study. Pastures within the area of the study was collected, kept in room temperature for four weeks applying toning of the green grasses for easy drying. Materials for ruminant feed composition along with medicinal plants was used applying scale of measurement. Such materials include bambara nut, bone meal, residue from grains, mault, brans (hay, straw, silage), cakes like PKC, sodium chloride, calcium sorbate as preservatives, saint leaves etc and maggot from Ngwo plant. These materials for feed composition were grinded, measured and mixed together using a formular. The aim of using the compounded feed was to harvest cattle within 7months in a year with at least weight of 665kg - 760kg. The researchers made use of focus groups like herders and veterinary doctors in carrying out the study. Observations, farm record books and hanging digital weighing scale was used for data collection. The instruments for data collection were validated by experts. The reliability of the instrument was determined using test-retest method outside the research sample area. The reliability index 0.78 was obtained. Thus, it was found reliable for the study. The researchers ensured control of extraneous variables precisely experimenter bias, predators, herder variability and initial group difference during the research.

Before the training commenced, the two groups were briefed separately on the tenets of the feeding process. The researchers trained regular herders and veterinary doctors who served as research assistants (focus groups) on what is involved in the study to meet up with the research conditions. The researchers used the compounded feed, farm record books, training manual prepared by them along with hanging digital weighing scale for the training of the experimental groups. The techniques on how to use the measuring devices and feeding process of calves were employed in delivery of the lesson. The control groups utilized nomadic herding or nomadic pastoralism as its technique in rearing calves. The training of farmers / herders lasted for three days.

After the training of herders, the study commenced with obtaining the pre- mean weight of calves from both groups. The weight scores served as pre- mean weight scores. Stabilization of the calves for their health status are done. The stabilization lasted for 30 minutes. Thus, feeding of calves starts with varying feeds within the same

environment. The feeding was done by herders using the compounded feed prepared by the researchers for experimental calves and pastures fed to control group calves within the environment. The feeding process in both groups lasted for 28 and 31 weeks (7months). In the last weeks of the feeding, the two groups of calves were weighed separately using hanging digital weighing scale to obtain post mean weight. Data were analyzed using mean weight of each cattle at every intervals of 4weeks (one month) for 28 weeks (7months).

Results

Research Question 1: What are the mean weight of Bunaji cattle fed with compounded feed and those fed through nomadic herding.

Table 1: Mean weight of Bunaji cattle fed with compounded feed and those fed through nomadic herding.

Group	**N**	**Ẍ Average Weight Before Treatment**	**SD**	**Ẍ Average Weight After Treatment**	**SD**	**Ẍ Weight Gain**
Experimental (Compounded Feed)	4	106	26.51	714.04	146.39	608.04
Control (Nomadic Herding)	4	109	27.25	161.73	15.12	52.73
Total	**8**					

In Table 1, it showed that experimental group cattle fed with compounded feed had mean weight of 106 before the treatment and 714.04 after treatment with standard deviations (SD) of 26.51 and 146.39. Control group cattle fed through nomadic herding obtained mean weight of 109 before the treatment and 161.73 after treatment with standard deviations (SD) of 27.25and 15.12.Their standard deviations were 146.39 and 15.12. The cattle in the experimental and control groups had mean weight gain of 608.04and 52.73 respectively.

Discussion

The result from Tables 1 revealed that compounded feed when fed with calf – cattle yield high growth within 7 months (213 days). This indicates a significant main effect of the treatment. The reason could be attributed to nutritional ingredients in the feed materials used for production of artificial feed. The ingredients had high-energy and high-protein diet. It equally restricted movement of cattle from one locality to another in search of feed and water. This practice fatten calf – cattle and confines them to feedlot and limiting their activity, which directs more energy into weight gain rather than physical exertion. Warg (2022) states that nomadic herding is a traditional way of raising livestock that involves moving from one place to another in search of pasture and water. Such practices elongates the fattening period, stress both the livestock, the farmer that rears it and spread diseases. Studies of Ahmed, Iqbal and Antahal (2023), Azhar, Faiz, Ali, Aziz, Akbar, Raza, Abdullah, Habib and Akram (2024) ascribed the cause of nomadic herding by Fulani's to climate change. The climate change results to drought. Drought simply means lack of rainfall and soil moisture leading to lack of river flow and shallow groundwater levels, including low reservoir levels. According to Fahad and Wang (2018), drought apparently emerge from increased concentration of greenhouse gases in the atmosphere due to human activities, primarily the burning of fossil fuels like coal, oil, and gas. Other factors include deforestation and agriculture, which release more greenhouse gases and alter the Earth's land cover. These human-driven changes amplified the natural greenhouse effect, trapping more heat and warming the planet. This emanated from twentieth century to our present twenty- first century. The findings of Hou, Xin , Shen , Qin , Altome , Hamed , Yan , Nurlan , Adilbek , Balzhan , Kussainova , Amarjargal , Fang Zhou and Sun (2023) emphasized that different grazing intensities and seasons significantly alter livestock feed intake in temperate meadow grasslands. Align with the findings of Hou et al and the present study, Eniola, Babatunde, Oyelami and Bamgbala (2017) described domesticated livestock's to have fast growth and fattening rate, more nutritional and free from cholesterol to wild livestock's. Similarly, the study of Babayemi, Ajayi, Olona, Anurudu and Ajayi (2018) on livestock value chain: Prediction of liveweight and cut yield of three indigenous breeds of cattle in Nigeria revealed that Bunaji cattle (White Fulani cattle) has higher meat yield to other breeds of cattle. Meat yield was found more when Bunaji cattle was domesticated.

Conclusion

Calf – cattle fed with compounded feeds has high weight gain, growth, fattening, balanced nutrition and meets specific physiological needs. It equally offers farmers two circles to rear calf – cattle in one farming season. This is because it was more balanced and efficient nutrient delivery compared to traditional grazing (nomadic herding) especially when using by-products or low-grade roughages.

Feeding cattle compounded feed can lead to increased productivity, including higher milk and meat yields, due to more balanced and efficient nutrient delivery compared to traditional grazing, especially when using by-products or low-grade roughages. However, this approach requires careful formulation to avoid issues like digestive problems or reliance on human-edible cereals, and a high-quality, consistently-formulated product is crucial for consistent performance and economic viability.

Recommendations

The following recommendations are made based on the findings;

1. Awareness creation to herders on the relevance of calve feeding on local feed for fast weight gain, growth and fattening.
2. Feeding calve with local feed curb out killings attributed to cattle open grazing (traditional method of herding) for sustainable peace in Nigeria.
3. Herders should be educated on formulation of balanced feed for calf – cattle in other to meet specific cattle needs, ensuring the concentrate-to-roughage ratio does not exceed 50% of the dry matter and maintaining a roughage particle size of 2-5cm to support healthy digestion.
4. Government through her agency and professional associations should ensure that herders / cattle producers employ best practices for safe and effective use of compounded feeds. These measures can improve livestock health and productivity while contributing to food security and economic growth

References

Ahmed, S., Iqbal, Z. & Antahal, P.C. (2023). Impact of climate change on nomadic herders livelihoods: Evidence from Bakarwal community in the western Himalayas in India. Environmental development, 48; 930 – 100. Sciencedirect.com/science/article/abs/pii/s2211464523001306.

Al-Mutairi, M.H., Al-Zahrani, K.H. & Qassem, H.S. (2023). Assessment of livestock breeders attitude towards the use of compound feed in the kingdom of Saudi Arabia. *Journal of Livestock Science,* 15: 242-248.

Azhar, Faiz, Ali, Aziz, Akbar, Raza, Abdullah, Habib and Akram (2024)

Babayemi, O. J., Ajayi, M. O., Olona, J. F., Anurudu, N. F. & Ajayi, F. T. (2018). Livestock value chain: Prediction of liveweight and cut yield of three indigenous breeds of cattle in Nigeria. *Nig. J. Anim. Prod. 2018, 45(2);* 265- 272.

Baris, A., & History, A.(2023). Impact of feed quality on livestock productivity. *Journal of livestock policy, 2, Issue 2 (1);* 1-10.

Berger, Q., Guettier, E., Urvoix, S., Bernard, J., Ganier, P., Chahnamian, M., Bihan-Duval, E.Le, Mignon-grasteau, S. (2021). The kinetics of growth, feed intake, and feed efficiency reveal a good capacity of adaptation of slow and rapid growing broilers to alternative diets. Poultry Science, *100, Issue 4,* 1-13.

Brit, A. (2024). What is livestock production in Nigeria. Retrieved on 19th August from https://en.m.wikipedia.org/wiki/animal-agriculture_in_Nigeria.

Eniola, O., Babatunde, R.O., Oyelami, B.A. & Bamgbala, T.T. (2017). Comparative analysis of nutritional composition of meat of domesticated and wildgrasscutter (Thryonomys Swinderianus). *Proceeding 42nd Annual Conference Nigerian Society for Animal Production* 26th – 30th March, 2017, Land Mark University, Omu-Aran.

European Union (EU) (2024). Slight decrease in animal production expected in 2024. Retrieved on 19th August from https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20240306-1.

Fahad, S. & Wang, J. (2018). Farmers' risk perception, vulnerability and adaptation to climate change in rural Pakistan. *Land use policy, 79;* 301 -309.

Faq. H., (2024).Compound feed refers to the feed that produced on the basis of animals' different growth stages, different physiological requirements and different production uses https://www.feedpelletplants.com/what-is-compound-feed.html

Hou, L.; Xin, X.; Shen, B.; Qin, Q.; Altome, A.I.A.; Hamed, Y.M.Z.; Yan, R.; Nurlan, S.; Adilbek, N.; Balzhan, A.; Kussainova , M., Amarjargal , A., Fang , W., Zhou, W., Sun, H. (2023). Effects of Long-Term Grazing on Feed Intake and Digestibility of Cattle in Meadow Steppe. *Agronomy,* 13, 1760. https://doi.org/10.3390/ agronomy13071760

Korsheva, I. & Chaunina, E. (2020). Biotechnological Methods for Increasing the Efficiency of Market Egg Production. *Advances in Social Science, Education and Humanities Research, 393,* 189-193

Korsheva, I. & Chaunina, E. (2021). The effect of compound feed on the productivity of broiler chickens. Bioweb of conferences, 37, 00107. Retrieved on 19th August from https://doi.org/10.105/bioconf/20213700107

Nworgu (2015). Nworgu, B.G. (2015). *Educational research: Basic issues and methodology.* (Third edition). Enugu: University Trust publishers.

Okeke, A.N. (2020). Performance of grasscutters (thryonomys Swinderianus) fed with varying composition of compounded fed. *IJRISS, IV,* Issue IX, 2454-6186.

Okekeokosisi, J.O.C. (2012). Effect of constructivist instructional model on students' achievement and retention in agricultural science. Unpublished 1st Degree project submitted to faculty of education, National Open University of Nigeria.

Warg, N.M. (2022). Nomadic herding: A sustainable way of life. Retrieved on 15th May, 2025 from https://pastoralism-climate-change-policy.com