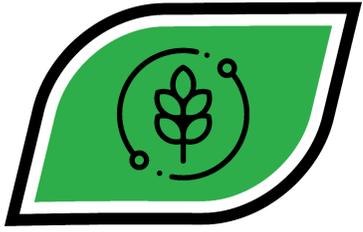


Analysis of Hydroponic Fodder For Animal Feeding and Health



Animal Feeding and Health

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Introduction

Hydroponic fodder is the animal fodder grown and produced within six to seven days by growing cereal grains or barley such as wheat or maize seeds in water or aqueous solution without soil by using hydroponic nutrients obtained from Azolla seedlings or cow dungs. Globally, hydroponic fodder is considered to be the best vertical animal or livestock feed compared to traditional fodder since it promotes high rate of animal growth, health and weight gain, improves milk quality and production in female animals, reduces weaning time of cattle from birth and can promote human economic gain by selling it.



Method

Construction of Hydroponic fodder system.

In our project, the hydroponic fodder system was constructed in semi-constructed environmental conditions with the temperature range of 20-32 °C and relative humidity of 79-89 % under control light. Materials used to construct hydroponic fodder include plastic pipes and bamboo logs, trays, shade netting and gunny bags.

- The hydroponic fodder system constructed covered a little space about 5ft x 5 ft and it was constructed near the livestock shade for easy operation.
- It had some open space between the roof and side walls to allow ventilation since when the shed is well ventilated and airy it helps to maintain temperature and humidity.
- The trays used to grow hydroponic fodder had the size of about 1.5 x 3 ft and they were made up of good and strong enough to hold the weight of the fodder.
- 15-20 small sized holes were made in trays for draining any excess water
- Three layers of bamboo and plastic racks were built inside the shed to hold the trays properly and the four layers racks were not too high to simplify spraying of water and removing the trays.
- Enough space was kept between two layers so as to easily water the seeds and also create slightly slope for each layer to one side of the rack for quickly and easily draining of water from the trays.
- Finally, small drainage line under slope side of a rack was made to facilitate easy draining out of water.



Figure 01: Photos showing the fully-grown hydroponic fodder



Results

From the results and graph above show that; the hydroponic fodder shows more effectiveness in promoting weight gain in Tilapia fish within short period of time than granular and flake food fed to Tilapia fish for the same number (200) of Tilapia fish. Therefore, hydroponic fodder promotes faster growth and high weight gain of fish and other livestock to ensure high market and economic gain to the farmers.



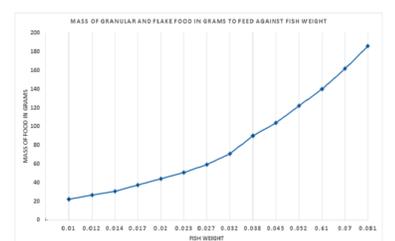
Figure 03: Photos showing hydroponic feeding to pigs, cows and chickens.

Limitations Of Results

- Variation of temperature and humidity during experiment.
- Quantity of hydroponic fodder limits the accuracy of experimental data.
- Time of keeping hydroponic fodder more than nine days decreases nutrients value.
- Lack of facilities like modern equipment's such as nutrients analyser machine.
- Roots of weeds slow down the growth of hydroponic fodder in the growing area.
- Air especially oxygen may interfere the chemical composition of hydroponic nutrients.
- Unhealthy and damaged seeds such as damaged wheat seeds will never germinate and grow properly.

Fish weight	Rate	Number of Fish	Mass of granular and flake Food in grams to feed
0.01	11.00	200	22.00
0.012	11.00	200	26.40
0.014	11.00	200	30.80
0.017	11.00	200	37.40
0.02	11.00	200	44.00
0.023	11.00	200	50.60
0.027	11.00	200	59.40
0.032	11.00	200	70.60
0.038	11.00	200	90.00
0.045	10.00	200	104.00
0.052	10.00	200	122.00
0.61	10.00	200	140.00
0.07	10.00	200	162.00
0.081	10.00	200	186.00

A GRAPH SHOWING MASS OF GRANULAR AND FLAKE FOOD IN GRAMS TO FEED AGAINST FISH WEIGHT.



Conclusion

The findings and results from the experimental hydroponic fish feeding regime confirms that the fish fed with hydroponic fodder had higher weight gain, high rate of growth and proper reproductive performance than the fish fed with cassava flour and soya. This shows that the hydroponic fodder is better than traditional fodder in promoting sustainable animal farming like fish farming and other domestic animals like cattle to livestock keepers in Tanzania if it is effectively practiced in large scale since it involves the use of less grazing space to feed the stock thereby improving the economy of the land, it enables the animal keepers to have control over the feed production in 365 days of the year whether in rain, hail, shine or snow thus ensuring the turnover of quality and quantity of livestock, it also enables the animal keepers to send their stock to the markets with high economic sense and hydroponic fodder enables the producers to have self-employment and economic gain when selling it to animal farmers.

References

- Dr Rachel Jemimah, E. et al(2015), Hydroponic green fodder production, Vol.I, No.I.
- Abdullah, A (2001), Nutritive value of Barley fodder grown in a hydroponic fodder system. Doctoral Dissertation, University Putra, Malaysia.
- Kuenga T (2017), Fodder production, CNR Journal.
- JambayGyeltshen (2016) ,Feed and fodder Resources Bhutan, NCAN.
- <http://grassfodder.com/hydroponics.php>

We delight extend and express our special thanks of gratitude and sincere appreciation to the school administration and staff members of Nganza Girls Secondary School especially the school headmistress Madam Yasinta T. Lyimo for her support in the course of this project.

We are also grateful to Mr. Peter Miligwa Mathias, a young scientist project mentoring teacher for his great supervision, constructive criticism and viable encouragement in preparation and accomplishing this project. Much thanks should also go to Mr. Raphael Majivu, dealing with Azolla and Hydroponics production in Dar-es Salaam and MrMasumbuko Tanzania fisheries and Training agency in Mwanza for their great assistance in our project.