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# Challenges Faced by Grass-cutter Farmers in Delta State: Implications for Teaching Animal Husbandry in Secondary Schools

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***Abstract***
*This Delphi study determined the challenges faced by grass-cutter farmers in Delta State, and its implications for teaching Animal Husbandry in secondary schools. The population of the study is comprised of twenty-two (22) grass-cutter farmers, out of which twenty (20) accepted to constitute the expert panel for the study. At the end of the round one, a total of 28 items were identified by grass-cutter farmers as the challenges they face in the grass-cutter production industry in Delta State. At round two, only 25 items met the cut-off mark of 2.50, which were later used to develop a third questionnaire for round three. At the end of round three, only 18 items reached consensus at 60% criterion. The items were high mortality rate, inexperienced Veterinary Doctors, scarcity of fresh vegetables and grasses in dry seasons, diseases infestation, among others. It was concluded that these challenges have implications for teaching Animal Husbandry in secondary schools in Delta State. it was therefore recommended that the strategies for curbing these challenges are built into training programmes for farmers to boost their competencies in grass-cutter production, Extension agents should conduct follow-up studies on grass-cutter farmers in Delta State to check their progress level, and how well they were able to overcome these challenges, among others.*

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## I. Introduction

Grasscutter (*Thryonomys swinderianus*), otherwise known as cutting-grass or cane rat is one of the most cherished meat being sought for in Nigeria due to the numerous benefits associated with it. Apart from being the most cherished, Asibey and Addo (2000) opined that it is the most expensive meat in most West African countries, such as, Nigeria, Togo, Benin, Ghana and Cote d' Voire. Also, most Chinese who are resident in Nigeria cherish the meat as regular meal and form a delicacy for entertainment of their guest from abroad (AbdulAzeez, 2014). This is because the meat is nutritionally superior to those of other macro-livestock, such as; sheep, goats, among others, due to its higher protein (19-23%) and mineral contents, coupled with the fact that the meat quality is also leaner and non-cholestrogenic (Boateng, 2005; Addo, Doodo, Awumbila, Awotmi & Ankrah, 2007).

Ocloo (1993) asserted that unlike some animals which may not be killed or touched because of religious dictates, traditional taboos or prejudices, the grass-cutter meat transcends religious prohibitions as muslims who do not consume rabbit or guinea pig are known to consume grass-cutters. The meat is therefore eaten by all social classes in both rural and urban settings (Onyeanusi, Akinola & Bobadoye, 2008; Odebode, et al., 2011; Owen & Dike, 2012; Etchu, et al., 2012). Igene (1992) specifically reported that grass-cutter plays an important role in traditional African medicine for preparation of concoctions for fertility, and so on.

Apart from the meat quality, it is also cheaper to produce than other traditional livestock, and generates lots of income for farmers. The smallness of the size is one of their most significant assets, since it makes it possible to raise and manage them in small areas and in clusters (AbdulAzeez, 2014). The meat does not only attempt to balance the shortfall in national animal protein supply, it could also offer opportunities to small scale farmers, rural dwellers, investors and business men for economic incentive and the much needed informal employment through its domestication (Mensah & Okeyo, 2005; AbdulAzeez, 2011).

The benefits of grass-cutters propelled the Federal Government of Nigeria to introduce grass-cutter production into the secondary school curriculum through the Animal Husbandry trade subject developed in 2009. According to NERDC (2011), the Animal Husbandry trade curriculum which began its implementation in 2011, emphasized that every secondary school must have a minimum of 10 grass-cutters that should be used to teach practical Animal Husbandry to students to enable them develop sustainable skills needed to fit into the grass-cutter industry after graduation. Sadly, ten years after the implementation of the Animal Husbandry trade curriculum, much progress has not been made in the grass-cutter industry as Delta State still have limited supply of grass-cutter meat due to the limited available grass-cutter farmers. While trying to trace the problem, Iyeke

(2021) discovered that most public schools in Delta State do not have a school farm, and when they are available, it is almost impossible to see live grass-cutters in such farms. Also, Iyeke and Ikeoji (2019) reported that the Agricultural Science teachers available to teach Animal Husbandry in secondary schools were neither trained nor employed specifically to teach Animal Husbandry. The only available option is for the Agricultural Science teachers to liaise with the grass-cutter farmers (industry-based experts) to enable students get access to their farms and learn from them.

The Charles Prosser's Theorems are very relevant in this study because it emphasized the need for involvement of experts in the industry to be part of the training process of students since the only reliable source of content for specific training in an occupation is in the experience of masters of that occupation; and also, the need for students to be taught by instructors who have had successful experiences in the application of skills and knowledge of the operations and processes they undertake to teach (Prosser & Quigley in Ikeoji, 2018). The experiential learning theory espoused by Kolb in 1984 also supports this view, as it stressed the need for learning to be focused on the application of classroom knowledge in the context of "real world" situations (Arnold, Warner & Osborne, 2006). In essence, teaching and learning in Animal Husbandry should follow the four stage process emphasized by Kolb (1984) in the diagram illustrated below:

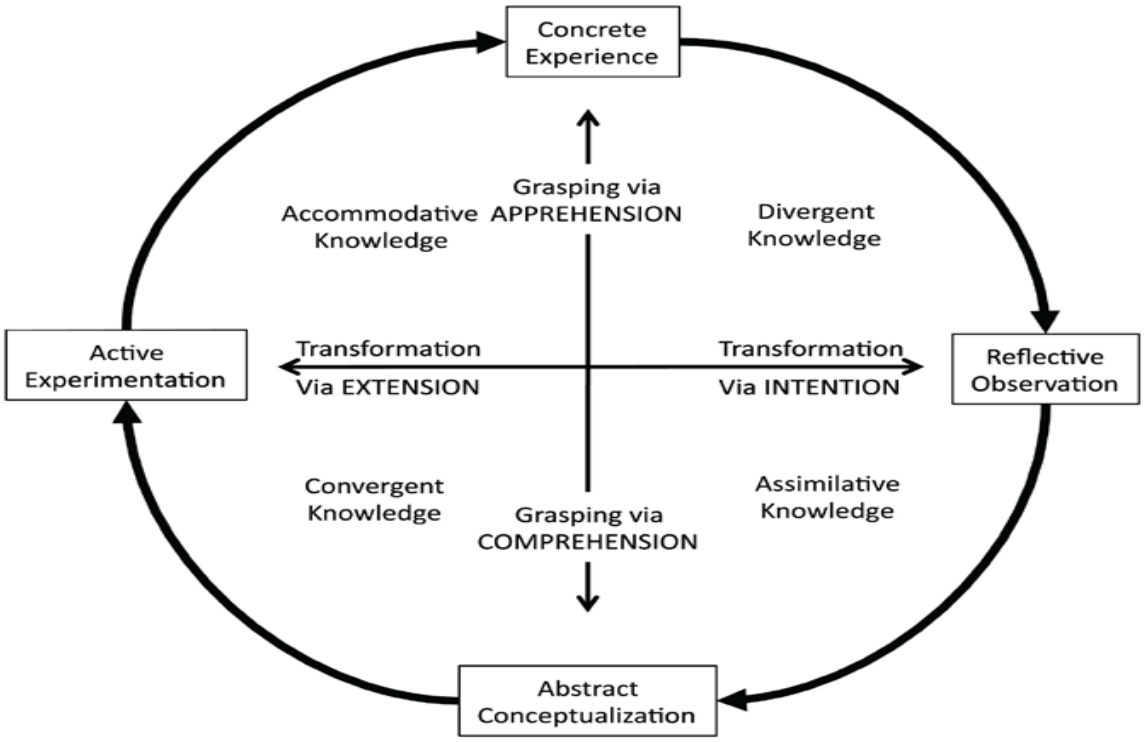


**Figure I: The Experiential Learning Process**

Source: Kolb (1984)

Figure I shows that learning should begin with concrete experience, whereby new experience or situation in Animal Husbandry are introduced to students. In this case, it is expected that students are introduced to a grass-cutter farm, and allowed to familiarize with the environment as they experience the various tasks demonstrated by grass-cutter farmers. The next stage is reflective observation of the new experience. Here, students are given the opportunity to reflect on their new experience and try to interpret it according to their own understanding. Stage three, which is abstract conceptualization allows students to reflect on their new idea, and try to modify what they have experienced. Furthermore, learners proceed to the fourth stage that involves the application of their ideas to the real world setting, and try to experiment what they have learnt. Phipps and Osborne (2008) suggested that Animal Husbandry should seek to engage learners in meaningful experiences by putting emphasis on learning-by-doing, which is apparent in the attention given to laboratory work, field trips, problem-solving and Supervised Agricultural Experience Programmes (SAEP). In carrying out these stages, the grass-cutter farmers are expected to guide the students through this process, since they are the industry-based experts, and have the necessary facilities for meaningful experiences to be acquired by students.

However, Ahenkan and Boon (2010) complained that the potentials of grass-cutters have not been exclusively harnessed in Nigeria, especially in Delta State, as the number of grass-cutter farmers has not improved due to the various challenges encountered in the grass-cutter production industry. Mwangi and Omore

(2004); Ahenkan and Boon (2010); Akinola, Etela and Emiero (2014); Aluko, et al. (2015); Ahaotu, et al. (2017) highlighted such challenges as lack of technical support on proper management practices, housing design, dry season feeding, sex determination, irregular supply of breeding stock, environmental issues, poor processing and marketing plan, high cost of housing, lack of access to credit, lack of balanced diet, poor producer training and education, inadequate infrastructural development, poor information dissemination, and incidences of diseases and mortality. The study, therefore, sought to address the implication of these challenges for teaching Animal Husbandry in secondary schools in Delta State.

**Purpose of the Study**

The purpose of the study was to determine the challenges faced by grass-cutter farmers in Delta State using a panel of experts (grass-cutter farmers); and to ascertain the implications of these challenges in teaching Animal Husbandry in secondary schools in Delta State.

## II. Methods

The study utilized the Delphi technique for experts (grass-cutter farmers) in the grass-cutter industry to reach a consensus on the challenges they encounter in grass-cutter production. According to Delp, Thesen, Motiwalla and Seshadri (1977), cited in Alibaygi, Midehkordi and Pouya (2012), the Delphi technique involves a group process that solicits, collates, and directs expert responses by reaching a consensus. In the opinion of Twin (2021), the Delphi method gives experts the opportunity to work toward a mutual agreement by simply circulating series of questionnaires and the subsequent release of related feedback for further discussion in each of the rounds. The experts' responses may shift as the various rounds are completed based on the information revealed by other experts participating in the study (Dalkey & Helmer, 1962). The Delphi method is appropriate for this study since Skulmoski, Hardman and Krahn (2007), has acknowledged it to be relevant in studies that requires understanding of challenges, opportunities, and solutions.

The population of the study comprised of grass-cutter farmers in Delta State; which was given by the Delta State Ministry of Agriculture and Natural Resources (2020) as twenty-two (22). The 22 experts were contacted by the researcher via telephone to schedule an appropriate time for phone call to solicit their inclusion in the study, and also to provide the needed information for the study. Out of the twenty-two (22) farmers that were contacted, two (2) of them declined due to personal reasons known to them.

The remaining twenty that accepted to participate received an open ended questionnaire to make a list of the challenges they face in the grass-cutter production industry. This process conforms with Schmidt's (1997) opinion that emphasized that the purpose of the first round in most Delphi studies is to brainstorm. Responses received from the 20 experts were summarized with the use of frequency counts. After the initial responses were received, they were summarized using frequency counts into 27 items.

For the second round, an instrument was developed using the items realized from round one on a four-point rating scale of: Strongly Agree (SA) = 4; Agree (A) = 3; Disagree (D) = 2; and Strongly Disagree (SD) = 1. The instrument was administered to the experts to indicate their level of agreement or disagreement to each of the items using the scales stated above. Means ($\bar{x}$) and Standard Deviations were used to analyze the data in this round, using the SPSS, Version 26 software. Since the instrument was designed on a 4-point rating scale, a cut-off mean ($\bar{x}$) score of 2.50 was set as the basis for agreeing or disagreeing to each of the items. Items with mean ($\bar{x}$) values of 2.50 and above were judged adequate and appropriate for inclusion into round three, which is the final round. A total of 25 items were rated agreed by respondents and included in round three.

In round three, the 25 items were used to design a questionnaire that gave the opportunity for experts to indicate their level of agreement to each item by simply ticking either the Yes, or the No option. This third questionnaire was introduced simply to determine the consensus reached by the experts. Their responses were analyzed using simple percentages in SPSS, Version 26. Twenty (20) items reached consensus at 60% criterion at the end of this round. This is the last round of the Delphi study, as Delbecq, Van de Ven & Gustafson (1975); Linston & Turoff (2002) stated that the iterations in a Delphi study are up to the researchers, and two to four rounds are typically considered appropriate to achieve a consensus.

## III. Results

The first round of the study used an open ended questionnaire, requesting experts to make a list of the challenges they face in the grass-cutter production industry. This gave a variety of responses, which were summarized into 27 items. Table 1 contains a summary of the list of challenges faced by grass-cutter farmers in the grass-cutter production industry. From the items, the most frequent challenges identified by the 20 respondents were item 1 (no available vaccination plan for grass-cutters), 2 (inexperienced Veterinary Doctors), 3 (scarcity of fresh vegetables, grasses in dry seasons), 4 (handling pregnant grass-cutters), 5 (Diseases infestation), and 6 (lack of incentives from the government).

**Table 1**

*Round One: Challenges Faced by Grass-cutter Farmers (n=20)*

| S/N | Challenges | Frequency (F) |
|---|---|---|
| 1. | No available vaccination plan for grass-cutters | 20 |
| 2. | Inexperienced Veterinary Doctors | 20 |
| 3. | Scarcity of fresh vegetables, grasses in dry seasons | 20 |
| 4. | Handling pregnant grass-cutters | 20 |
| 5. | Diseases infestation | 20 |
| 6. | Lack on incentives from the government | 20 |
| 7. | High mortality rate | 19 |
| 8. | Getting fresh vegetables everyday | 19 |
| 9. | Predators such as snakes, and ants, attacking animals | 19 |
| 10. | Scarcity of drugs for grass-cutter | 18 |
| 11. | High cost of housing | 16 |
| 12. | Lack of access to credit facilities | 14 |
| 13. | Handling injured animals | 13 |
| 14. | Difficulties in getting good breeding stocks | 12 |
| 15. | Difficulties in getting pelleted feeds | 12 |
| 16. | Continuous fighting among matured male animals | 11 |
| 17. | Prolonged labour leading to death of the animal | 10 |
| 18. | Providing warmth for pregnant grass-cutters | 9 |
| 19. | Keeping the house, drinkers, feeders clean on a daily basis | 9 |
| 20. | Wastage of vegetables, grasses during feeding | 8 |
| 21. | Theft | 7 |
| 22. | Lack of experienced extension agents to provide information on better management techniques | 6 |
| 23. | Sterile offspring | 5 |
| 24. | High cost of nutrient supplements | 5 |
| 25. | Decreased number of neonates at birth | 2 |
| 26. | High cost of paying workers at the farm | 1 |
| 27. | High cost of farm land | 1 |

Source: Field Work (2021)

In Round Two, grass-cutter farmers were administered another questionnaire, and asked to rate their agreement level with the twenty-seven items summarized in Round One. Items with mean values greater than or equal to 2.50 were regarded as the challenges faced by grass-cutter farmers in the grass-cutter production industry. A total of 25 items had means greater than 2.50; with the highest mean as 4.00 and standard deviation of 0.00 for items 2 (No available vaccination plan for grass-cutters), 4 (Inexperienced Veterinary Doctors), 7 (Scarcity of fresh vegetables, grasses in dry seasons), 11 (Scarcity of drugs for grass-cutter), and 17 (Diseases infestation).

**Table 2**

*Round Two: Mean Scores and Standard Deviations and Ranking of the Challenges Faced by Grass-cutter Farmers (n=20)*

| S/N | Challenges | Mean ($\bar{x}$) | SD |
|---|---|---|---|
| 1. | High mortality rate | 3.75 | 0.55 |
| 2. | No available vaccination plan for grass-cutters | 4.00 | 0.00 |
| 3. | High cost of housing | 3.85 | 0.37 |
| 4. | Inexperienced Veterinary Doctors | 4.00 | 0.00 |
| 5. | Lack of access to credit facilities | 3.30 | 1.17 |
| 6. | Getting fresh vegetables everyday | 3.40 | 1.05 |
| 7. | Scarcity of fresh vegetables, grasses in dry seasons | 4.00 | 0.00 |
| 8. | Continuous fighting among matured male animals | 3.70 | 0.66 |
| 9. | Difficulties in getting pelleted feeds | 3.35 | 1.09 |
| 10. | Wastage of vegetables, grasses during feeding | 3.75 | 0.79 |
| 11. | Scarcity of drugs for grass-cutter | 4.00 | 0.00 |
| 12. | Difficulties in getting good breeding stocks | 3.45 | 1.05 |
| 13. | Providing warmth for pregnant grass-cutters | 3.05 | 1.91 |
| 14. | Handling pregnant grass-cutters | 3.55 | 0.89 |
| 15. | Decreased number of neonates at birth | 3.50 | 0.95 |
| 16. | High cost of nutrient supplements | 3.70 | 0.80 |
| 17. | Diseases infestation | 4.00 | 0.00 |
| 18. | Handling injured animals | 3.55 | 0.95 |
| 19. | Prolonged labour leading to death of the animal | 3.50 | 1.00 |
| 20. | High cost of paying workers at the farm | 2.75 | 1.25 |
| 21. | Predators such as snakes, and ants, attacking animals | 3.90 | 0.31 |
| 22. | Theft | 3.10 | 1.25 |
| 23. | Lack of experienced extension agents to provide information on better management techniques | 3.75 | 0.55 |
| 24. | Keeping the house, drinkers, feeders clean on a daily basis | 3.80 | 0.52 |

| | | | |
|---|---|---|---|
| 25. | Lack on incentives from the government | 3.85 | 0.49 |

Source: Field Work (2021)

In Round Three, a third questionnaire having a Yes and No option was designed using the 25 items in Round Two. Grass-cutter farmers were asked to go through the same exercise like that of round two in an attempt to capture any change in their responses, and indicate their level of agreement with each of the items. Only 15 grass-cutter farmers participated in this round, and constitute the expert panel for this round. Out of the twenty-five items, only 18 items reached consensus set at 60% criterion. These 18 items are however, regarded as the major challenges faced by grass-cutter farmers in the grass-cutter production industry.

**Table 3**

*Round Three: Agreement Level of the Challenges Faced by Grass-cutter Farmers (n=15)*

| S/N | Challenges | Yes | Agree (%) |
|---|---|---|---|
| 1. | High mortality rate | 15 | 100.0 |
| 2. | Inexperienced Veterinary Doctors | 15 | 100.0 |
| 3. | Scarcity of fresh vegetables, grasses in dry seasons | 15 | 100.0 |
| 4. | Diseases infestation | 15 | 100.0 |
| 5. | Scarcity of drugs for grass-cutter | 14 | 93.3 |
| 6. | No available vaccination plan for grass-cutters | 13 | 86.7 |
| 7. | Continuous fighting among matured male animals | 13 | 86.7 |
| 8. | Wastage of vegetables, grasses during feeding | 13 | 86.7 |
| 9. | Handling pregnant grass-cutters | 13 | 86.7 |
| 10. | Predators such as snakes, and ants, attacking animals | 13 | 86.7 |
| 11. | High cost of housing | 12 | 80.0 |
| 12. | High cost of nutrient supplements | 12 | 80.0 |
| 13. | Lack on incentives from the government | 12 | 80.0 |
| 14. | Lack of access to credit facilities | 10 | 66.7 |
| 15. | Difficulties in getting good breeding stocks | 10 | 66.7 |
| 16. | Handling injured animals | 10 | 66.7 |
| 17. | Difficulties in getting pelleted feeds | 9 | 60.0 |
| 18. | Lack of experienced extension agents to provide information on better management techniques | 9 | 60.0 |
| 19. | Getting fresh vegetables everyday | 8 | 53.3 |
| 20. | Providing warmth for pregnant grass-cutters | 8 | 53.3 |
| 21. | Decreased number of neonates at birth | 8 | 53.3 |
| 22. | Prolonged labour leading to death of the animal | 8 | 53.3 |
| 23. | Keeping the house, drinkers, feeders clean on a daily basis | 7 | 46.7 |
| 24. | Theft | 5 | 33.3 |
| 25. | High cost of paying workers at the farm | 1 | 6.7 |

Source: Field Work (2021)

Table 4 revealed the major challenges faced by grass-cutter farmers that reached the 60% criterion of consensus. The highest consensus was 100%, which were obtained from item 1 (High mortality rate), 2 (Inexperienced Veterinary Doctors), 3 (Scarcity of fresh vegetables, grasses in dry seasons), and 4 (Diseases infestation). Nine (9) other items scored 60% and above, making a total of 18 items that reached consensus.

**Table 4**

*Round Four: Major Challenges that Reached Consensus at 60% Criterion*

| S/N | Consensus of Challenges | Agree (%) |
|---|---|---|
| 1. | High mortality rate | 100.0 |
| 2. | Inexperienced Veterinary Doctors | 100.0 |
| 3. | Scarcity of fresh vegetables, grasses in dry seasons | 100.0 |
| 4. | Diseases infestation | 100.0 |
| 5. | Scarcity of drugs for grass-cutter | 93.3 |
| 6. | No available vaccination plan for grass-cutters | 86.7 |
| 7. | Continuous fighting among matured male animals | 86.7 |
| 8. | Wastage of vegetables, grasses during feeding | 86.7 |
| 9. | Handling pregnant grass-cutters | 86.7 |
| 10. | Predators such as snakes, and ants, attacking animals | 86.7 |
| 11. | High cost of housing | 80.0 |
| 12. | High cost of nutrient supplements | 80.0 |
| 13. | Lack on incentives from the government | 80.0 |
| 14. | Lack of access to credit facilities | 66.7 |
| 15. | Difficulties in getting good breeding stocks | 66.7 |
| 16. | Handling injured animals | 66.7 |
| 17. | Difficulties in getting pelleted feeds | 60.0 |
| 18. | Lack of experienced extension agents to provide information on better management techniques | 60.0 |

Source: Field Work (2021)

## IV. Discussion of Findings

The challenges identified by the study were in agreement with the opinion of Mwangi and Omore (2004) who stated that grass-cutter farmers are confronted with problems ranging from high cost of housing, and lack of access to credit. Similarly, Adu, Alhassan and Nelson cited in Menz (2014) revealed that exposure to weather, predators, insufficient shelter, inadequate water provision based on the inaccurate belief that grass-cutters obtain necessary water solely from food source, and general lack of background knowledge regarding the biology of grass-cutter were some of the challenges encountered by grass-cutter farmers. Ogunjobi and Onah (2008); Ahaotu, et al. (2018) identified the challenges faced by grass-cutter farmers as inadequate credit facilities, untimely supply of inputs, inadequate management skills, inadequate information, low extension contact, high cost of production materials and inadequate processing technology.

The findings corroborate the assertions of Heloo (2005); Akinola, Etela and Emiero (2014) that grass-cutter farmers encounter challenges such as; large capital investment, lack of readily available breeding stock, problems of feeding during dry season, and disease infestation. The findings also support the findings of Awotwi, Tudeka and Adu (2007) who reported that grass-cutter farmers are usually plagued with dry forages with low nutrition value during dry season; and Adu, et al (2000, 2005) who revealed that health challenges resulting to sudden deaths, worm infestation and respiratory diseases are problems faced in the grass-cutter production industry. Furthermore, the findings are in line with Benjamin, Akinyemi and Ijomah (2006) who opined that the major problems encountered by grass-cutter farmers include high initial capital, stock procurement, inadequate time to attend to the needs of the animal, inadequate medical attendants, disagreement with landlords over space to rear grass-cutter and inadequate follow-up by extension services.

**Implications for Teaching Animal Husbandry in Secondary Schools in Delta State**

This Delphi study that sought to determine the challenges faced by grass-cutter farmers in Delta State, has implications for the teaching of secondary school Animal Husbandry. The grass-cutter farmers are the industry-based experts expected to liaise with Agricultural Science teachers to implement the Animal Husbandry trade curriculum in secondary schools in Delta State. In essence, they are expected to have had meaningful experiences in the application of skills and knowledge to the operations and processes they want to teach the students; thus, they should train students to meet the demand of the market. This can be achieved by attaching each secondary school in Delta State to a grass-cutter farm in their host community to give students the opportunity to learn practical Animal Husbandry from such farms, to compliment classroom learning. But this has not been achieved in Delta State as grass-cutter farmers are still plagued with numerous challenges limiting their interest and effectiveness to have meaningful success in the grass-cutter industry, and also their ability and effectiveness to teach students. Majority of them have not been able to devise a mechanism to resolve their challenges, and this had led to the decreasing number of grass-cutter farmers in Delta State. Most of them that started the venture quitted because they encountered one or more challenges that affected their farms negatively, and when those with intentions of venturing into the business are briefed of these challenges, many of them get discouraged and would not want to initiate their plans. This has led to decreasing rate of grass-cutter farms and farmers in Delta State, and the subsequent reduction on the number of available industry experts to teach students practical Animal Husbandry. It is expected that these challenges are curbed to encourage people to go into grass-cutter farming, so that there will be enough farms in Delta State where students can be taught practical Animal Husbandry.

## V. Conclusion/Recommendations

The study identified 18 major challenges faced by grass-cutter farmers in the grass-cutter production industry. The challenges include high mortality rate, inexperienced Veterinary Doctors, scarcity of fresh vegetables and grasses in dry seasons, and diseases infestation, among others. The study has also revealed that these challenges have some implications in the teaching of Animal Husbandry in secondary schools in Delta State. Based on these findings, it was recommended that:

i. the strategies for curbing these challenges are built into training programmes for farmers to boost their competencies in grass-cutter production;

ii. Extension agents should conduct follow-up studies on grass-cutter farmers in Delta State to check their progress level, and how well they were able to overcome these challenges;

iii. Grass-cutter farmers should brief students on some of the challenges they will face in the industry and how they can be overcome; and

iv. Government should provide incentives for grass-cutter farmers to encourage students to go into grass-cutter farming after graduation.

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