

# Biosecurity Measures Needed by Rural Farmers for Effective Farm Animal Production in Ebonyi State

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## Abstract

*This study focused on identification of bio security measures needed by rural farmers for increased animal production in Ebonyi State. Three research questions were developed to guide the study. The study adopted survey research design, and used multi-stage random sampling technique to select 156 rural farmers and 30 extension agents. A structural questionnaire was developed by the researcher on four points rating scale for data collection from the respondents. The data were analysed using mean and standard deviation at 0.05 level of significance. It was found that farmers could use segregative actions like quarantine, exclusion, and full restriction; sanitary actions such as waste management, cleaning and disinfecting of equipment and premises, and the eradivative actions like vaccination and culling in biosecurity of farm animals. It is recommended that government should assist rural farmers to get needed inputs in order to organize intensive animal production for a better bio security; and veterinary doctors should be mobilized to monitor rural farmers and helps them adopt biosecurity actions identified by this study.*

**Keywords:** Farmers, Bio security, Environment, Food, Production, Animal, Pests,

## Introduction

The quest to protect human environment, animal and plant health, food and other useful organisms against pests and diseases has made biosecurity issues increasingly important and topical in the society. Food and Agricultural organization (FAO, 2010) explained biosecurity as the protection of health through avoidance of disease. In the context of this study, biosecurity is the measures used to reduce risks of introduction and spreads of animal pests and diseases. It is the adoption of a set of attitudes and behaviours by rural farmers to reduce risks in all activities involving farm animal production. It is also that process of managing biological risks associated with animal production in order to keep their food safe for human consumption. Biosecurity is essential for promoting sustainable agriculture, food production, livelihood security, economic development and profitability of animal production.

In their views, Casal, Manuel, Mateu and Martin (2007), stated that bioinseurity in animal production emanates from movement of people, vehicles, and agricultural goods. The authors stressed further that bio-insecurity emerges from poor farming practices; wrong selection of parent stocks, and climate changes. To Pitkin and Deen (2009), bio-insecurity in animal production results from effects of rodents, wild birds, insects, use of contaminated feeds, and poor sanitary conditions of the farm. The differences in the sources of bio-insecurity in animal production call for different measures to be adopted by farmers to keep animals safe for human use.

A measure is explained by Hornby (2010), as an official action that is intended to deal with a particular problem. In this study, measures are defined as actions to be performed by rural farmers to keep the life of farm animals and their products safe for human use. They are various options or steps available for animal food producers to use in preventing and eradicating pests and diseases. Pinto and Urcelay (2003), classified the biosecurity measure options based on goals such as isolation, sanitation and traffic control, While Dargatz and Garry (2004), grouped the actions into preventive and eradivative measures. To eradicate, means to eliminate a pathogen from a farm using vaccines, or culling of the infected animal. But, it is often said that prevention is better than cure. Thus, FAO (2010) emphasised the use of preventive measures, and then classified biosecurity measures into three operational steps: segregation, cleaning (sanitation) and disinfecting. Segregation, according to Roman (2006), involves keeping potentially infected animals and materials away from uninfected ones. The author explained further that segregation is the creation of barriers in form of restriction of movement of people, vehicles, and other animals into a farm; and enforcing changing of foot wears and clothing before entry into a farm. Cleaning, according to Venglovsky (2006), involves proper sanitation of the animal house environment. It streams from washing of feeding equipment, vehicles;

and all other materials to be used in animal pens to remove any iota of dirt. To buff up segregation and cleaning actions, the animal farm environment needs to be disinfected. Disinfections involve the use of inorganic chemical to destroy pathogens and pests that might have contaminated the farm environments. Other preventive measures, according to Ezeibe (2010), are vaccination of the animals, traceability and transparency of animal stocks. All these measures are tools in the hands of skilful farmers to improve the life of farm animals and the profitability of animal production.

In Ebonyi State, farm animal production, according to Egbe (2009), is characterized by poor sanitary conditions and mixed systems of production. The author stressed further that the systems of production include free run, semi-intensive system, small scale intensive production, multi-species integrated production and large scale confined production. In their opinions, Amass and Clark (2009) said that each system of animal production requires certain biosecurity measures. They stated further that quarantine for newly purchased animals can be practised in all the systems, while total exclusion and restriction of movement is not possible in a free range and small scale production systems.

Unfortunately, animals in the study area are left to the small scale rural farmers who traditionally leave the animals to scavenge with minimum attention for their lives. This system is characterized by minimal health care, and improper housing and feeding (Egbe, 2009). This leads to spread of diseases, low fecundity and low meat yield. It is in recognition of this, that this study was designed to determine the biosecurity measures to be adopted by the rural farmers to enhance animal production.

This study will provide vital information to investors, and serve as a guide to farmers for farm animal management. It will help to reduce incidence of zoonotic effects on human life arising from consumption of infested farm animals. It is also hoped that the information from this study will help farmers to effectively improve productivity and profitability of animal food production.

### **Purpose of the Study**

This study aimed at determining biosecurity measures to be used by rural farmers for effective production of farm animals in Ebonyi state. Specifically, the study sought to:

1. Identify segregative measures to be utilized by rural farmers in biosecurity of farm animals.
2. Find out sanitary actions needed by rural farmers to enhance biosecurity in farm animals
3. Identify eradivative actions required by rural farmers in biosecurity of farm animals.

### **Research Questions**

Three research questions guided the study.

1. What are the segregative measures to be utilized by rural farmers in biosecurity of farm animals?
2. Which sanitary actions are needed by rural farmers to enhance bio security of farm animal?
3. What are the eradivative actions required by rural farmers towards biosecurity of farm animals?

### **Hypothesis**

There is no significant difference in the mean responses of farmers and extension agents on segregative measures used by rural farmers in biosecurity of farm animals.

### **Methodology**

This study was carried out in Ebonyi State. It covered the three Educational Zones in the State: Abakaliki, Afikpo and Onueke Educational zones. Survey research design was adopted for the study. It utilized multi-stage random sampling method to select two communities from each of the three zones. Thereafter, 26 farmers and 5 extension agents were randomly selected from each of the six communities. This gave a total of 186 respondents made up of 156 farmers and 30 extension agents. A structured questionnaire (egbeze) was used to collect data from the respondents. The questionnaire was developed by the researchers on four point rating scales: highly required, moderately required, minimally required and not required. It was face validated by 3 experts in Technology and Vocational Education, Ebonyi State University Abakaliki. Data collected through the questionnaire were analysed using mean and standard deviation to answer the research questions and t-test statistics was used to test the hypothesis at 0.05 level of significance.

### **Results and Discussions:**

The results of the study were obtained from the research questions answered and hypothesis tested. They were presented in table one, two, three and four.

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**Table 1: Mean ratings of the responses of farmers and extension agents on Segregation Action Required by Rural Farmers for Enhancing Biosecurity**

S/N	Item Statements	$\bar{X}$	SD	Remarks
1	Introduce animals from within the farm, village or market	2.71	0.49	Required
2	Ensure quarantine (isolation) of newly purchase animals	2.70	0.50	Required
3	Maintain long distance between farms	2.51	0.51	Required
4	Install net against wild birds, rodents and insects into the farm.	2.88	0.42	Required
5	Ensure strict control of entrance and exist of visitors and vehicles in the farm	2.87	0.43	Required
6	Create loading area (bay) at the farm	2.60	0.51	Required
7	Fence around and close entrance to farm area	2.59	0.52	Required
8	Limit the number of sources of replacement stocks.	2.67	0.53	Required
9	Keep different animal species in separate pens	2.55	0.57	Required
10	Practice permanent housing of farm animals	2.89	0.41	Required

Source: field survey, 2014

Data presented in table 1 show that all the items had means scores above 2.50, which is the cut-off point. This signifies that each of the items is required as a segregation measure for biosecurity of farm animals in rural areas. These findings are in line with the report of Roman (2006) that segregation is the first and most important element of biosecurity as it involves keeping potentially infected animals and materials away from uninfected animals. The result agrees with the reports of FAO (2010) that segregation involves exclusion of people, vehicles and wild animals from the farm. It implies that farmers require good communication on risks related to sources of stocks, visitors, infested vehicles, and wild animals. However, maintenance of long distance between farms had a mean ( $\bar{x} = 2.51$ ) which is slightly above the cut-off point. This result is in keeping with the common practice in rural areas where farmers site their farms at random; with little consideration of the distance between farms. Again, the low mean rating on fencing of the farm indicates poor attitudes of rural farmers towards control of farm animals.

**Table 2: Mean ratings of the responses of (farmers and extension agents) on Sanitary Action Needed by Rural Farmers to Enhance Biosecurity**

S/N	Item Statements	$\bar{X}$	SD	Remarks
1	Provide clean feeds and water to animals	2.89	0.39	Required
2	Eliminate all animal waste properly	2.83	0.42	Required
3	Observe daily sanitary routine practices such as washing of feeding equipment and drinkers	2.88	0.41	Required
4	Clean slaughter houses regularly to ensure a very high level of hygiene	2.77	0.45	Required
5	Properly maintain clean farm environment through cleaning and sweeping the surroundings	2.75	0.47	Required
6	Disinfect farm premises vehicles and equipment against vectors and pathogen	2.68	0.51	Required
7	Ensure specific clothing and foot wear for use at farm.	2.57	0.55	Required
8	Wash dirt, lice and tick off the animals.	2.63	0.56	Required
9	Create foot wear cleaning and disinfecting station.	2.47	0.63	Not required

Source: Field Survey, 2014

Data presented in table 2, show the results on sanitary actions required to enhance biosecurity in animal production. Each of the 8 out of 9 items had a mean above 2.50, which is the cut-off point. This signifies that each item is an activity to be performed towards biosafety of farm animals in rural areas. The actions with very high ratings are avoidance of contaminated feeds and water ( $\bar{x} = 2.88$ ) and effective waste management ( $\bar{x} = 2.83$ ). These findings are in line with the general biosafety practices outlined by Casal et al (2007) as good management of animal droppings, ideal feeding, cleaning and disinfecting animal pen and its equipment. Observance of high level hygiene in slaughter houses is another item that enjoyed high rating, with a mean of 2.77. This finding is necessary to correct common practice in most rural areas where slaughter houses are absolutely filthy and are risk

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point for spreading of animal diseases (FAO, 2010). This calls for effective cleaning and disinfecting measure, which is a polishing step in biosecurity, to be utilized in slaughter houses. Item 9, which was on creating foot wear cleaning and disinfecting station was rated below the cut off point of 2.50. This implies that it will be difficult to be practiced in rural areas where farmers have no specific wears for use in animal farms.

**Table 3: Mean ratings of the responses of farmers and extension agents on Eradicative Actions towards Biosecurity of Farm animals.**

S/N	Item Statements	$\bar{X}$	SD	Remarks
1	Carry out active surveillance and monitoring animal behaviours to identify infection fast	2.67	0.51	Required
2	Cull, kill and dispose infected animals	2.81	0.42	Required
3	Stop infection from spreading by engaging specialized veterinarian for vaccination of animals	2.80	0.42	Required
4	Use all-in-all-out system to control infectious diseases	2.59	0.60	Required
5	Sell and or consume healthy animals to stop spreading zoonotic diseases	2.79	0.46	Required
6	Observe pest management program to control spreading of disease through insects, rodents and wild birds	2.74	0.49	Required
7	Practice parasite control through deworming of farm animals	2.78	0.05	Required
8	Have good knowledge of the health status of animal stocks for easy control of their diseases	2.52	0.69	Required

**Source: Field survey, 2014**

The data presented in table 3, reveal that all the items had mean ratings above 2.50. Implication of this is that the items form major eradicated actions in biosecurity needed by rural farmers for effective animal production.. The items with high ratings are on culling and disposal of sick animals ( $\bar{x} = 2.81$ ), use of vaccines to stop spreading of animal diseases ( $\bar{x} = 2.80$ ) and avoid selling or consuming sick and dead animals ( $\bar{x} = 2.79$ ). These findings are in line with the recommendations of Amass and Baysinger (2006) that farmers should be keen in detecting infection fast, kill and bury infected animals and stop infection from spreading through vaccination. Other areas that enjoyed high ratings are careful observance of pest management program ( $\bar{x} = 2.74$ ) and parasite control by deworming ( $\bar{x} = 2.78$ ). These results are in keeping with the views of Dee and Deen (2006) that effective pest management is a step in biosafety of animals.

However, respondents rated the item on having good knowledge of the health status of animal stocks low, with a mean ( $\bar{x} = 2.52$ ) which is slightly above the cut-off point of 2.50. Low rating on this item signifies low veterinary services to rural farmers, with which farmers can get data on health status of their animal stock. It is also a pointer that most rural farmers lack knowledge with which to trace and identify the supplier herd.

**Table 4: t-test Analysis of the Responses of Rural Farmers and Extension Agents on Segregative Actions towards Biosecurity of farm Animals.**

S/N	Item statements	Group	N	$\bar{X}$	SD	DF	t-cal	t-table	Rmk
1	Avoid introduction of animals from outside the farm, village or market.	RF	156	2.72	0.53	184	1.01	1.96	NS
		EA	30	2.71	0.49				
2	Ensure quarantine of newly purchased animals.	RF	156	2.71	0.51	184	1.0	1.96	NS
		EA	30	2.70	0.50				
3	Maintain long distance between farms.	RF	156	2.52	0.52	184	1.68	1.96	NS
		EA	30	2.50	0.51				
4	Install nets against rodents, insects and wild birds.	RF	156	2.90	0.43	184	1.21	1.96	NS
		EA	30	2.89	0.41				
5	Ensure strict control of entrance and exist of visitors and vehicles.	RF	156	2.88	0.44	184	1.15	1.96	NS
		EA	30	2.86	0.43				
6	Create loading area (bay) at the farm.	RF	156	2.61	0.52	184	0.98	1.96	NS
		EA	30	2.59	0.51				
7	Full fencing ground and close entrance to the farm.	RF	156	2.62	0.53	184	1.92	1.96	NS
		EA	30	2.60	0.52				
8	Limit the number of sources	RF	156	2.68	0.54	184	1.89	1.96	NS

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	of replacement stocks.	EA	30	2.66	0.53				
9	Keep different animal species in separate pens.	RF	156	2.58	0.56	184	1.81	1.96	NS
		EA	30	2.56	0.55				
10	Practice permanent housing of farm animals.	RF	156	2.90	0.52	184	1.23	1.96	NS
		EA	30	2.88	0.51				

**Key:** F = Farmers

EA = Extension Agents

N = Number of respondents in each group

DF = Degree of Freedom

From table 4, the results of t-test analysis reveal that the t-calculated in each item is less than the t-table value (1.96). This signifies that there is no significant difference in the mean responses of rural farmers and extension agents on segregative actions towards biosecurity of farm animals. The hypothesis is therefore upheld. The similarity in the opinions of the respondents testifies that actions could be applied to safe animals' life and keeps their products safe for human use.

### Conclusion and Recommendations

This study focused on identification of biosecurity to be adopted by rural farmers for increased animal production. Biosecurity measures in food and animal agriculture is held in a very high esteem now that there is great need to increase volume of food for internal use and exports. It is also very vital; to reduce incidence of zoonotic diseases. It is therefore imperative to expose rural farmers to biosecurity measures so that they can manage biological risks in food and animal products. The study revealed that biosafety measures are more easily adopted in a confined animal production system.

Based on the results of this study, the following recommendations are made.

1. Government should make policies that will improve the supply of inputs to enable native farmers organize intensive animal production.
2. Government should also extend technological advances to agricultural biosecurity. This can provide devices for detecting and suppressing pests and diseases of farm animals.
3. Animal producers, exporters and importers should be made to comply with biosecurity regulations.
4. Veterinary doctors should be mobilized by the government to supervise and monitor activities of farmers and others involved in animal production and distribution to enforce the adoption of the biosecurity measures identified by this study.

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