

Does Strain Matter in Laying Performance in Improvement of Poultry Business Entrepreneurs, Delta State Nigeria

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Abstract

This experiment was conducted to compare the egg production performance of three-layer strains, namely Hyline, Nera black and ISA brown. The number of birds used for the study was 50 pullets per strain. The 50 pullets in each strain were randomly assigned into five pens/units of 10 birds each thus giving a total of fifteen pens under randomised complete design (CRD). They were placed under the same treatment diet, feed and water were provided ad libitum. The short-term egg production recorded which includes age at first egg, weight of first egg, percentage hen-day egg production, hen-housed production and total number of eggs produced were taken from the 20th-28th week of the laying pullets. The data collected/obtained were subjected to analysis of variance. Result showed significant differences ($p < 0.05$) among the three strains in all egg production parameters except weight at first egg and laying mortality. The Bovan Nera black strain had the highest value in hen day egg production, hen-house egg production and total number of eggs than hyline and ISA brown strains which had similar values. The Bovan Nera black strain was also the fastest to start laying as indicated by lowest value in age at first egg.

In all, these traits exhibited by the Bovan Nera black are of much economic significance in the off-farm poultry product marketing, which entrepreneurs are mostly concerned with. In conclusion, Nera black strains is more ideal for egg production compared to the hyline and ISA brown strains.

Keywords: Strain laying performance Improvement, Poultry business, Entrepreneurs

Introduction

In Nigeria today, the mantra "beyond oil" has become a "buzz word" owing to the dwindling revenue from oil and its attendant adverse effect on the economy and citizens' welfare. Governments have acknowledged the impact of Agrobusiness small and micro agro-enterprises (SME) on job creation, improvement of people's standards of living and hence on overall impact on the economy and thus encouraging entrepreneurship in this sector as a way of diversifying the economic reliance on oil for development. The term entrepreneurship is used to describe a dynamic process of creating incremental wealth (Shailesh et al. 2013). This wealth is created by individuals who take the major risks in terms of equity, time and career commitment of providing value to some product or services. The product or service itself may or may not be new or unique but value must somehow be infused by the entrepreneur by securing and allocating the necessary skill and resources. In other words entrepreneurship is the application of energy for initiating and building an enterprise (Mishra et al.,2010). Development of agricultural entrepreneurship has been an important policy to increase the value of agricultural production and open up the sector for businesses which is clear departure from what was obtained in the past when oil prices were at their peak. Therefore, a policy change of this nature requires the development of entrepreneurial and organizational competency in farmers. Developing entrepreneurial skills of farmers can take two approaches. The first is to amend the social, economic, political and cultural frameworks that hinder and foster those that stimulate their development. The second is encouragement of farmers, via their personalities and capabilities, to kindle the development of entrepreneurship. If agro-enterprise competitiveness is to be improved by nurturing entrepreneurial behaviour, both approaches have to be considered.

Agro-business or agro-enterprise is a sector in which most of the rural SMEs operate in and includes all participants in a commodity vertical structure, from suppliers, farmers, assemblers, processors and distributors to ultimate domestic and international consumers. The agri-business SMEs are of importance to the Nigerian economy because they enhance economic growth, help accelerate development and are a business solution to rural poverty. In view of the dwindling government revenue from crude oil it is a delight to know that

government has realized that the two concepts, entrepreneurship and agribusiness are not mutually exclusive and have extended support for their promotion.

Livestock is one of the major sectors that help in development of agricultural entrepreneurship. The popular adage remains true "that no nation that is rich in livestock is poor and no nation that is poor in livestock is rich". Livestock has remained a significant component of the agricultural economy of Nigeria which in addition to food production has provided incentives for economically sustainable agriculture. The most common livestock production practice in the rural areas of Nigeria is poultry keeping, (Okoli et al, 2014) and a high rate of productivity that can result in the production of meat within eight weeks and eggs within eighteen weeks (Okoli et al, 2014). Poultry comes fourth among sources of animal proteins for human consumption in Nigeria and contributes about 10% of the national meat production (Sheranbeen 1996)

The importance of the poultry industry is that it concentrates in providing employment not only to those engaged in its production directly but also for hatchery operations, feed dealers, manufacturers of incubators, building material suppliers, processor of egg and poultry products and all dealers engaged in the marketing of egg and poultry from time to time. Demand for animal products in the country, however, continues to rise and it's driven by improvement in personal income, population growth and increasing urbanisation (Delgado et al, 1998). Chicken meat is the fastest growing protein of all protein sources and the demand for Poultry is ever increasing (Sani 2006). According to Okoli et al. 2004, "there is need for improvement in livestock production systems in Nigeria and it could begin with orientation of graduates on the need to get involved in agro livestock business as a form of self-employment". The rising demand for Poultry products has led to tremendous increase in the number of poultry farms all over the country. However, advancement in the poultry sector in Nigeria generally is currently being undermined by the escalating cost of feeds and concentration only on a particular type of strain for layers. In order to reduce the cost, it becomes imperative to find other hidden local agricultural residues by-products and wastes and source for more strains that would help to enhance poultry industry.

Many strains of commercial egg chickens are imported into Nigeria. The performance of these strains is influenced by genotype and environmental interactions which sometimes result in poor performance and high mortality. Olawumi and Dudusola (2012), pointed out the effect of genotype-environmental interaction on egg production which can be seen very early in their production cycle. According to Farhad and Rahimi(2011), egg weight is a primary egg production trait and numerous factors influence the weight of eggs. Amongst them are the age and genotype of laying hens.

According to Nigerian farming online Magazine (2021), the most popular layer strains in Nigeria are ISA brown, Bovan black, Hyline, Lohmann and Dekalb-Amberlink. They are highly adaptable. ISA brown laying hens are globally recognised for its strong and reliable results, it is also renowned as the global superstar in performance (Hendrix, 2021). Extensive field testing with ISA brown shows that ISA brown has exceptional feed conversion and is capable of laying up to 500 first quality eggs. They are able to adapt well to different climate poultry management styles and housing systems. ISA brown also maintains excellent persistency in egg production.

However, Izundu et al., (2019) reported that Nera black strain was a more efficient egg producer than ISA brown. Also, comparative performance of Bovan Nera when compared to other commercial pullet strain shows that Bovan Nera has better feed conversion ratio feed efficiency and attained greater weight. The hyline brown pullets are raised for superior egg production. Hyline brown produces a high egg mass with high quality and very easy to manage. It is the world's most balanced brown egg layer and produces more than 480 rich brown eggs at 100 weeks.

Problem statement

The current rising cost of poultry products (eggs,meat) in the agri-business enterprise whereby a crate of egg is sold at #2,800 - #3,000, has necessitated the need to intensify efforts in the discovery of other strains of layers; in addition to the discovery of alternative feed ingredients.

The aim of the research

To quantitatively and qualitatively assess the egg production traits (the number of eggs, the size/weight of the eggs) of the three strains of layers during the short term period of the research (8-9 weeks from the point of lay).

To reduce the cost and meet up the demand for eggs in the agri-business entrepreneurship industry

Methods**Location**

The study was carried out at the poultry unit of the Chukwuemeka Odumegwu Ojukwu University Teaching and Research Farm, Department of Animal Science, Faculty of Agriculture Igbariam campus, Anambra State of Nigeria. Igbariam lies within the Anambra River basin between longitude 6° 56' 38.7" East and Latitude 6° 23' 26.4" North with a minimum and maximum temperature range of 27-36°C and relative humidity range of 59.91% . The average annual rainfall in Anambra River basin area is between 1000mm-1500mm. The experimental birds were procured at day old, brooded and reared until they attained the age of experiment (the age at the point of lay). The study, thus, lasted for a total of 28 weeks covering the growth phase and short-term laying period of the experimental birds.

Experimental Design and Management of Experimental Birds

One hundred and fifty birds (150) aged 20 weeks consisting of fifty birds per strain were randomly distributed into five groups of each strain with each group consisting of 10 birds. This was done for verification, validation of study findings, reliability and generalisability thereby building confidence. Feed and water were produced ad libitum (available at all times). The birds were managed using the deep litter system with good sanitation practices and routine vaccination properly carried.

Data collection

Data was collected and recorded on replicate basis for a period of 8-10 weeks of the experiment. The following parameters were determined to help achieve the objectives of the study: age at first egg, weight of the egg, hen-day production, hen-house production and total number of eggs laid during the period of the experiment.

Data analysis

Data collected and observations made were subjected to one-way analysis of variance (ANOVA) in a complete randomised design (CRD) and this is because only one factor was observed (strain)

This is done according to the procedure of Steel and Tonne (1980), where ANOVA indicated significant different treatment means which were separated using Duncan's multiple range test (Duncan MSS)

Effect Of Strain on Egg Production Of Layers

Parameters	Hyline.	Nera black.	ISA brown.	SEM.	LOS
Age at first egg(days)	166.53 ^b .	162.73 ^a .	168.20 ^b .	0.66.	*
Weight at first egg(g)	40.22.	39.68.	40.05.	0.22.	NS
Hen-day egg production (%)	15.80 ^a .	22.76 ^b .	15.57 ^a .	0.75.	*
Hen-house egg production	15.80.	22.76.	15.57.	0.75.	*
Total egg number	30.00 ^a .	43.80 ^b .	29.73 ^a .	2.70.	*
Mortality%	0.00.	0.00.	0.00.	0.00.	NS

^{abc} = with different superscript along the same rows shows significant difference at ($p < 0.05$)

LOS = Level of significance

NS= Not significant ($p < 0.05$)

*= significant

The result showed that the mean hen-day egg production and hen-house of Nera black were significantly ($p < 0.05$) higher than those of hyline and ISA brown. Also, Nera black strain was the fastest to come to laying and the most efficient egg producer as it had the lowest number of days (162.73) for age at first egg and highest values in the total number of eggs (43.80). In all, no mortality was recorded and the birds were apparently healthy during the experiment.

Discussion

The result showed significant differences ($p < 0.05$) among the three strains in all egg production parameters except weight of first egg and mortality

The observed values of hen-day egg production and hen-housed egg production were lower than that reported by (Anyanwu et al. 2008) but close to the range reported by (Oyewole et al. 2011). The higher values of Nera black in hen-day, hen-housed egg production and total number of eggs agreed with the work of (Izundu et al. 2019) who reported that Nera black strain was a more efficient egg producer than ISA brown. The higher number of eggs produced by Nera black was probably due to favourable weather conditions and gene effects on production (Merat, 1990) Also it was observed that Nera black pick up easily and faster after a prolonged unfavorable condition.

Conclusion And Recommendations

The result of this study showed or revealed that an entrepreneur (Poultry egg producing farmer) in Nigeria stands to benefit in their investment by incorporating or raising these different strains (Nera black, ISA brown and hyline) especially Nera black in their farms. In view of the genetic variability recorded in egg production, Nera black had the maximum egg production and the fastest to come to lay which entrepreneurs should not overlook. ISA brown strain before now has been the most popular breed in 80-85% farms in Nigeria. This study now revealed that Nera black strain is superior to ISA brown and hyline in terms of

egg production and adaptability adjustment which introduction of it into farms will help in enhancing Agrobusiness entrepreneurship sector.

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