

TECHNICAL VOCATIONAL EDUCATION AND TRAINING (TVET) OPPORTUNITIES IN QUAIL PRODUCTION FOR GAINFUL SELF-EMPLOYMENT AMONG IN-COLLEGE AND OUT-OF-COLLEGE YOUTHS IN NIGERIA

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Abstract

The study considered Technical Vocational Education and Training (TVET) Opportunities in Quail Production for Gainful Self-Employment among In-College and Out-Of-College Youths in Nigeria. This paper assessed skills in quail production that can be used by Nigerian youths for gainful self-employment in either in- college or out-of- college situation. These quail skills are classification of quail, quail production, farm management, feeding of layer quails, feeding of broiler quails, Pen/Cage management of broiler quails, and Pen/Cage management of layer quails. The paper also discussed on guidelines for quail production, why quail rearing is lucrative, reasons for starting quail production business, products gotten from quail, TVET opportunities in quail production,. The work concluded that quail production is a lucrative business that can provide self-employment to both in-college and out-of-college youths in Nigeria. It was recommended among others that both State and federal Governments should create awareness through agricultural extension agents among in-college and out-of- college youths on the various TVET opportunities available in quail production.

keywords: TVET Quail Production, In-College Youths, Out-Of–College Youths, Gainful Self-Employment

Introduction

Technical and Vocational Education and Training (TVET) is education and training that provides the necessary knowledge and skills for employment (UNESCO-UNEVOC, 2017). TVET uses many forms of education in the training of individuals for skills acquisition in various disciplines. These forms of education include formal, non-formal and informal learning, and is said to be important for social equity and inclusion, as well as for the sustainability of national

development (UNESCO, 2017). TVET, literacy and higher education, are three priority subsectors for UNESCO, all in a bid foster inclusive and equitable quality education and lifelong learning opportunities for all (Marope, Chakroun, & Holmes, 2015).

According to Nduononwi, Akpan and Silas (2017), Technical and Vocational Education and Training (TVET) are the type of learning that provides learners with skills which prepare them for a job or an occupation. Nduononwi, Surveyor, Nduaesa & Bassey (2017) stated the objectives of TVET with regards to its' definition to include the followings:

- a. To assist students develop an insight and understanding about industry and its place in our society. Since industry is a constructive, dynamic force in the world today, it is the responsibility of the school to provide opportunities for the student to understand this force better;
- b. To assist students develop problem-solving abilities related to materials, processes and product of industry. The problem-solving approach in TVET involves creative thinking and gives the students the opportunity to apply principles of planning and design, construction techniques and computations to the solution of problems;
- c. To assist the students develop skills in the proficient and safe use of tools and machines;
- d. To assist students to make choices regarding educational and occupational goals;
- e. To train students to exhibit safe behaviours in the workshop and relate these to situations in the school, home and community; and
- f. To assist students/trainees to evaluate manufactured and constructed projects on the bases of set criteria such as quality of construction, appropriateness of materials, function, utility or purposes. TVET is part of a tertiary training that puts full emphasis on skills and knowledge required for a particular job function or trade (Savion, 2018). TVET opportunities are those business areas and/or jobs which are available for TVET or vocationally trained students which will sustain them, make them self-reliant and as well make them employers of labour after relevant skills acquisition in-school and out-of-school.

Employment opportunities abound in all TVET programmes among which are agricultural education, Business education, Computer education, Home-economic education, and Technical education among others. TVET opportunities in agricultural education exist in crop and livestock production. One of them is in quail production or quail farming. Quail is a collective name for several genera of mid-sized birds generally placed in the order of Galliformes. Specifically, quail belong to over 130 species of small-tailed birds classified under the family of Phasianidae or Odontophoridae. Quails are easy to rear. This is because they are hardy in nature, resistant to some poultry diseases, and eat many things including seeds, grains, fruits, vegetables, insects and commercially prepared feed. They are one of the poultry birds reared by humans for consumption.

Poultry are domesticated birds kept by humans for their eggs, meat, and feathers. Poultry refers to a variety of birds raised for food, fibre, or entertainment (Jacob, 2015). Such birds include chicken, quail, pigeon, guinea fowl, ostrich, duck, turkey, goose, peacock, and pheasants. Quail farming is becoming more and more popular due to its health benefits and as such, there are numerous TVET opportunities in quail farming which Nigerian youths can venture into for self-sustainability, self-reliance and self-employment opportunities. These will:

1. Create jobs and thereby help to reduce social vices such as stealing, armed robbery, kidnapping, prostitution, and other vices, which occur mostly due to unemployment in Nigeria and ignorance of the TVET opportunities for sustainability and reliability.
2. It will also grow the economy since it is one of the TVET opportunities that lead to economic prosperity.

By Unites Nations definition according to Adesope (2007), Youths are individuals who are within the age bracket of 15-24years. In Collage Youths fall within the age bracket of 17-20years when they are actively involved in full post. Secondary tuition either in Collages or Unversities to orepate them for the world of work graduation. On the other hand, out-of Collage Youth (21-24 years) according to Offiong and Okirie (2018) are Youth who either dropped out of school or graduated from school but are unemployed, unemployable or underemployed. The need to get them properly upskilled for employability or gainful self-employment becomes imperative otherwise they may constitute a menace to the society through involvement in anti-social activities.

This paper, therefore, sought to highlight the TVET opportunities that are available in quail farming with particular reference to: classification of quail, quail farming, reasons quail-rearing is lucrative and TVET opportunities in quail production in terms of feeding/ management of quails, pen/cage management of quails, quail farming equipment as well as processing and marketing of quail products.

Classification of Quail

Quail is classified as follows:

Kingdom: Animalia

Phylum: Chordata

Class: Aves

Order: Galliformes

Family: Phasianidae, Odontophoridae

Genus: The genus of quail is divided into two, the new world and the old world thus:

New World

Callipepla, Cyrtonyx, Dactylortyx, Philortyx, Colinus, Odontophorus, Oreortyx, Rhynchortyx.

Old World

Coturnix, Anurophasis, Perdicula, Ophryisia

Quail Farming

Quail farming, otherwise known as quail production, is the process of rearing and raising quails for commercial uses of quail meat and quail eggs (Asif, 2018). Quail farming is also the rearing of different quails under controlled and hygienic environment in order to get their eggs, meat and litters. It is a lucrative business-like other poultry farming ventures such as chicken, turkey or duck farming in Nigeria (Agbota, 2017). Rearing quails for eggs and meat production is not difficult but requires care to be taken while performing some tasks such as selection of breed, meat production, egg production, housing, feeding, care and management of quails, along with marketing strategies.

Reasons Quail Rearing is Lucrative

According to Sookdin (2016), Quail rearing is lucrative because, (a) quails are very easy to raise and the business is self-sustaining (b) quail products are delicious and healthy (c) quail farming has low maintenance and lower operating costs as quails do not eat much and are highly resistant to most diseases (d) the demand for quail products is growing fast because of its health benefits, and the profit potential is substantial. According to Ibeleme (2017), further reasons one should start a quail production business include the fact that it creates employment, it is profitable, it is easy to start and that it is early maturing. According to Bello (2018), among some important guidelines to follow if one hope to start quail farming are as follows: (a) the technician should make the cage or room in such a way that it is secured from cats, snakes, rats, thieves, and so on. (b) the cage or room should be well-ventilated. (c) the cage or room should be cleaned regularly; this is because a dirty environment leads to diseases out-break. (d) the quails should be given clean water. Water should always be available as quails drink much water. (e) the quails should be given quality feed.

Vocational Opportunities in Quail Production

The TVET opportunities in quail farming include, but not limited to:

Formulation and Selling of Quail Feeds: At the age of six months, quail consumes around thirty (30) to thirty-five (35) grams of feed per day. It requires about 400 grams of feed for the production of dozens of eggs (Priti & Satish 2014). Feed represents almost 70% of the cost of rearing quail. It is mainly composed of grains such as maize, Sorghum or millet. An adult quail eats around 14-18g per day (up to 20-25g/day depending on the laying rate and nutrition quality of the feed). The feed must always be fresh. To achieve this, feeds should be stored in well-sealed containers in a cool and dry place, protected from rodents, dust, mites and other pests. Quails need high-protein feed. Protein content should be 25-28% for chick feed (as well as 1% calcium and 0.5% phosphorus), 22% for fattening and 24% for laying hens. The feed must be finely ground (Mondry, 2016).

Construction of Quail Pen/Cage and Selling of Quail Cages

The cages are often made with several floors (that is, mesh and wooden floors). However, this method is not recommended as it does not allow the cage to be properly aired and causes the birds to be stressed. It is, therefore, better for the technician making the pen or cage to leave some room between the cages to ensure better air circulation, and not to have more than three floors. The cage must be well-ventilated and installed in buildings in order to protect the quails from sun, rain and wind. The cages can be made of wood and chicken mesh or chicken mesh alone. If wood is used, it is better to attach the planks so that they can be replaced individually if they are damaged or deteriorate. It should be known that a chicken mesh cage is easier to clean and disinfect. The bottom of the cage can be made of wood and covered with 5cm of wood shavings or 1.5cm wire mesh. The floor must be horizontal, but with a slight 5° slope for laying hens, to make it easier to collect the eggs. For quail chicks, it is necessary to cover the 7mm wire mesh with paper for the first week at least, as their feet are too small and they could seriously hurt themselves. Later, wire mesh should have spaces of not more than 7mm until the birds are fully grown, when 1.5cm mesh can be used.

Quall Cage Building

Technicians can build cages to the following measurements: 1m long x 0.5 m wide x 0.5 m high, or 2m x 0.5m x 0.5 m. The second option allows the quail to run. For cages that are 2m long, plan parts that can be separated into two compartments so that they can be used for smaller groups of breeders if necessary. The 1m x 0.5m x 0.5m cages can accommodate a group of breeders consisting one male and five females. The feeding trough and water fountains can be placed inside the cage or attached to the outside to ensure proper sanitation and to save space. The feeders and water fountains should be properly spaced to prevent the birds from hurting themselves because during feeding, there is a lot of pushing and shoving. It is also a good idea to add a small sand bath (about 30cm x 35cm). This will improve co-habitation by making the birds (quails) less aggressive, coupled with the fact that ingestion of sand is good for the digestive system (Mondry, 2016). Branches of trees should be placed on the floor and/or sticks should be constructed on the cage/pen wall so that the quails can perch on them. The top of the cage or pen should not be left open as quails can easily fly out.

Vocational Opportunities in Quail Hatchery:

The farmer must have the necessary hatchery equipment when running quail hatchery business. Hatchery takes place between the sixteenth and eighteenth day of incubation for 85-90% of the fertilized eggs, which corresponds to 75-80% hatchability percentage of the eggs placed in incubator. It is preferable not to open the hatching incubator from the fifteenth day until all the chicks have hatched, as every time the door is opened, the humidity drops considerably. At hatchery, the chicks weigh five to six grams and they must remain in the hatchery incubator to be perfectly dry. For eggs to be set in the hatchery, eggs from fast-growing breed should be selected (Mondry, 2016).

Vocational Opportunities in Quail layer Production:

The quail breeds which are famous for egg production are known as layer breeds. The following breeds are very popular for commercial layer quail farming: (a) Tuxedo (b) English White (c) British Range (d) Pharaoh (d) Manchurian Golden. For a successful breeding in quails, a male quail should be allowed to run with every four to six female quails. Also, proper hygiene should be maintained in the quail pen/cage. Egg production depends on factors such as temperature, light, feeding/watering, care and management of the birds (Mondry, 2016).

Feeding Management of Layer Quails

According to Padheriya and Rabari, (2017) the quality and quantity of feed with method of feeding has got major contribution in the environment component and the controlling of the productive performance. This feed accounts for 65-70% expenditure in production of quails. Hence, due care must be taken for correct feeding. Layers are maintained on controlled feedings to avoid fat deposition which may hamper further laying. Generally, layer feeding is divided into two phases. First phase is from 18/20 to 42 weeks and second phase is 43-72/75 weeks till marketing. Energy content is increased by 50-100kcal/kg of feed in second phase (Padheriya and Rabari, 2017). Average daily feed consumption of layer (light breeds) depending on age/laying percentage is presented in the figure below.

Average daily feed consumption of layer (light breeds) depending on age/laying percentage.

Age	Laying percentage	Daily feed/day/layer (g)
18	4	70
19	9	74
20	15	77
21	22	80
22	45	85
23	70	85
24	85	95
25	92	100
26	93	105
27-28	94	110
29-30	95	120
31-32	94	120
33-35	93	118
36-38	92	115
39-41	91	115
42-45	90	114
50-58	88-83	112
59-63	82-79	112
64-72	78-75	110

Fig 1: Average daily feed consumption of layer (light breeds) depending on age/laying percentage.

Source: Padheriya and Rabari, 2017

It should be noted that the above figures are only guidelines of high-producing breeds under standard conditions. The actual performance may vary depending on breed, climate, the health of birds, management and quantity of feed (Padheriya and Rabari, 2017).

Laying Pen Management

In order to keep the quails healthy and productive, the hygienic quail farming methods which are mentioned below should be followed:

1. always keep their house dry and clean;
2. ensure proper illumination and circulation of air inside the quail house/pen;
3. bury dead birds or burn them;
4. do not allow other birds, animals or visitors enter the quail house;
5. ensure hygienic and balanced feed supply;
6. provide adequate fresh and clean water according to their demand;
7. place a foot dip at the entrance to the quail house;
8. the feeders and water fountains should be washed regularly to avoid infection;
9. sick birds should be culled;
10. the birds should be kept according to their age; and

11. the eggs should be removed from the pen to prevent them from breaking it.

TVET Opportunities in Quail Broiler Production

There are some quail breeds which are reared for meat production. The quail breeds which are famous for meat production are known as broiler quail breeds. They include: Bobwhite (American) and White Breasted (Indian). Newly hatched quail broiler chicks can be purchased from a quail farm or the farmer can hatch his own. Newly hatched chicks require specific brooding care for about two to three weeks. They, should, therefore be separately kept in a brooder house and provided with artificial heat source with adequate light for three weeks. They require adequate temperature, proper ventilation, sufficient light, proper hygiene, supply of feed and water in adequate quantity.

Feed Regime in Quail Broiler

According to Randall (2007), a standard ration for either growing or breeding quail may not be available commercially. If this is the case, good quality, fresh, commercial turkey or game bird diets are recommended, preferably fed as crumbles to minimize feed wastage. For the first six weeks, the broiler quails should be fed a diet containing approximately 25% protein, about 12.6 mega joules (MJ) of metabolisable energy (ME) per kilogram, and 1.0% calcium. A good quality commercial chick ration for game birds or turkeys contains about 25%-28% protein. If this is not available, a fowl chick ration (20-22% protein) can be used, but the birds will grow rather slowly. The dietary requirements for birds nearing maturity are similar except that calcium and phosphorous levels must be increased. Shell grit or ground limestone can be added to the diets after five weeks of age, or it may be provided separately as free choice. Layers diet should contain about 24% protein, 11.7MJ of metabolisable energy per kilogram, and 2.5%-3.0% calcium. The latter may need to be increased to 3.5% in hot weather when the birds eat less food but still require calcium to maintain egg production.

Quail Broiler Pen Management

The pen management in quail broiler production is almost the same as that of layer quail pen management. The management practices include the following: (1) the pen /cages should always be clean and dry. If there is any water spillage, the litter should be removed as soon as possible to avoid infection; (2) there should be proper ventilation and proper light circulation in the pen house; (3) the birds should be kept according to their age; (4) they should be kept according to their specie; (5) the feeding troughs and water fountains should be washed regularly to avoid infections and diseases; (6) sick birds should be culled immediately; (7) dead birds should be burnt or buried; (8) a veterinary doctor should be called as soon as the farmer notices that the birds are not active irrespective of favourable weather; (9) do not allow other birds, animals or visitors enter the quail house/pen; (10) the farmer should always wash his hands after working in the quail pen; (11) ensure hygienic and balanced feed supply; (12) provide adequate, fresh and clean water; (13) place a foot dip at the entrance to the quail cage; and (14) the farmer should on no account administer drugs to the birds. It is the duty of a veterinary doctor.

TVET Opportunities in Selling Quail Farming Equipment/Farmer's Wears.

The followings are quail farming equipment which youths can sell and make money. Water fountains; Feeding equipment; Brooders or heaters; Incubators; Egg tray; Poultry plucker rubber finger; Poultry incubator controller; Ventilation fan; Egg washer; Cages and coops; Dressing machine; Fly trap; Coverall; Gloves; Hair caps (Kathiravan, 2013). These quail farming equipment are explained hereunder.

Water Fountains: Water fountains are of various types which are pan and jar type, water basin made of plastic/wood with grill, bell type automatic water, nipple drinker, manual drinker. Clean water is required for proper growth in quails therefore; drinkers are equipment used in supplying water to the quails. The drinkers must be washed regularly to avoid disease outbreak and infection.

Feeding Equipment: They include the following types: Linear feeder, circular feeder, shell grit box, automatic feeder. Feeders are equipment used in feeding poultry birds such as quails. The feed is deposited in the feeder and the birds feed from it. The amount of feeders provided for a poultry farm should be according to the number of birds available. It is important that the feeders should always be kept clean to ensure proper health condition of the birds.

Heaters or Brooders: It is essential that the temperature of the quail farm be regulated especially during cold weather. The brooder is an equipment used in regulating and increasing the temperature of the poultry farm. This helps to keep the birds warm when the weather is cool. Examples of brooders include charcoal stove/kerosene stove, gas brooder, infra-red bulbs, reflectors/hovers.

Incubator: This is an instrument used in hatching eggs. Egg hatching with an incubator can be described as a means of hatching eggs in an unnatural way. This means can be employed when there are many eggs to be hatched.

Egg Tray: This is equipment used in setting the eggs. It is tray-like equipment where the eggs are placed for sampling.

Poultry Plucker Rubber Finger: This is equipment applied to poultry dressing machine. These rubber fingers are fixed to the bottom and side plates of the dressing machine in order to produce many dressed birds in a short period.

Poultry Incubator Controller: This is equipment used for controlling the incubator and timer counter. It displays the temperature and humidity conditions of the incubator.

Ventilation Fan: This is equipment used in ensuring maximum ventilation in the quail farm. It is also used in reducing the temperature of the poultry farm (quail farm) during hot weather.

Egg Washer: This is equipment that makes use of a powder called 'the egg washing powder'. Water is added into the egg washer with the egg washing powder. It is used in washing the eggs before delivery.

Cages and Coops: This equipment is used in keeping birds. They are suitable for small scale quail farming.

Dressing Machine: This is equipment used in plucking the birds' feathers after slaughtering. The uses of a dressing machine make quail dressing easier, cleaner and hygienic.

Fly Trap: This is equipment used in controlling flies around a quail farm. It helps in reducing the number of flies in the farm.

Vocational Opportunities in Processing/Marketing of Quail Meat and Eggs

A farmer can process quails and sell while others can sell their live quails. This is because while some buyers do not have time to process them, some cannot process the quails. However, in most cases, processed quail is always preferable. In this case, quails that are of market weight are slaughtered at about six to eight weeks. The meat can be sold raw, deboned, with bones, cooked, fried, roasted etc. they can be processed as cut-up parts such as drums ticks, breast meat, wings, thighs, half or quarter quail meat. The raw meat can be packaged in plastic containers, refrigerated, and sold or they can be sold at local markets as soon as they are slaughtered. Quail eggs can be marketed raw, fried, boiled or pickled. In order to sell boiled eggs, the eggs are selected and boiled in groups. They are then placed in cold water or ice so that the hard shells can be removed easily. Bottles (used in bottling boiled quail eggs) are then filled with eggs and brine. They are then sealed and prepared for marketing (Bezuidenhout, 2017).

Vocational Opportunities in Production and Processing of Quail Manure

A farmer can use his quail manure in a variety of ways. Some farmers feed it to fishes. This is known as integrated fish farming. Before the quail litter is fed to the fishes, it must be dried properly to remove all water. This is done to reduce the risk of disease transfer or the infection of the fishes. Some farmers send the manure to gas-producing industries where they will use the manure in making biogas. Alternatively, the farmer can use the manure to fertilize the soil. The quality of the manure can be improved before adding to the soil through a process known as vermicomposting which is the process of using various species of worms, usually red wigglers, white worms and other earthworms, to create a mixture of decomposing vegetable or food waste, bedding materials, and vermicast. Vermicomposting is basically a managed process of worms digesting organic matter to transform the material into a beneficial soil amendment. The earthworms being voracious eaters consume the biodegradable matter and give out a part of the matter as excreta or vermicast. The vermicast-containing nutrients are rich manure for the plants. Basically vermicast supplies the nutrients and growth-enhancing hormones to plants. Additionally, it improves the soil structure leading to increase in water and nutrient holding capacities of soil.

Conclusion

It has been seen that quail production is very profitable like other poultry farming ventures such as those available in chicken, turkey or duck farming businesses. Quail production is a great source of employment and income. It has also been seen that the vocational opportunities in quail production include, but not limited to, the formulation and sale of quail feeds, construction of quail

cages and pens and the selling of quail cages, the hatchery sector of quail farming, the layer sector of quail farming, the broiler sector of quail farming, the selling of quail farmer's wears, selling of quail drugs (mostly done by a veterinary doctor), processing and/or marketing of quail eggs, marketing of live quails, processing and marketing of quail meat, production, processing and marketing of quail meat, production, processing and marketing of quail manure (quail litter). Quail production is, therefore, a lucrative business which has the following benefits: income generation, employment opportunity, it requires small capital to start, gives rapid return on investment, the droppings are sources of manure while the meat and eggs are highly nutritious, thus, on high demand.

Recommendations

Based on the study's findings, the followings are recommended:

1. The State government, through the Ministry of Education, should organize Seminars, workshops, conferences, symposia, from time to time for quail farmers in order to keep them updated on things concerning quail farming.
2. Government, through the Ministry of Sports, Youth and Culture should organize training programmes for interested youths who want to venture into quail farming business. This will make them self-employed and employers of labour, thus, leading to economic prosperity.
3. Agricultural Development Programmes Agencies should, through the extension agents, create awareness to youths about the various vocational opportunities that are available in quail production. This can be achieved through such media as television, newspaper, radio, one-on-one discussion, churches etc.
4. Government, through the Ministry of Education, should provide the necessary funds and training to the in-school youths on quail production enterprise. The in-school youths will then establish quail enterprises when they are out of school.

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