

Broiler cockerel production in semi intensive system



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Every year billions of egg-type cockerels are produced in the world. The associated breeding industry has become prosperous for egg-type cockerels in terms of meat flavour compared to fast-growing-type broilers. Many researches have been carried out to evaluate the nutritional requirements of broilers; conversely, little research has been performed on the nutritional factors of egg-type cockerels. At present, most diets formulated are uneconomical for the producers of cockerels. Wang C. et al, 2005.

The desire of every poultry farmer is to produce large quantity of meat and eggs throughout the year irrespective of the environmental conditions.

(Eilkheir S., Ahmed M., Gadir A., 2008) which explains why the production of laying cockerels is not given much importance. In Mauritius, the production of poultry grew by 4. 8% in 2009 to reach 44, 000 tonnes compared to 42, 000 tonnes in the year 2008. (CSO, 2009 – 2010) The poultry industry has prospered due to an increase in purchasing power of Mauritians. This has resulted in the development of the poultry sector as an integrated industry with the private companies being involved from feed preparation to marketing of the poultry products through production of day old chicks. (FAO, Country Report, 2007). In the other hand, there hasn't been much research on growth of layer cockerels because of their slow growth rate compared to the fast growing broilers.

To satisfy the higher demand for meat products on time, livestock production and densities of birds per square metre have significantly gone high, often close to urban centres. Industrial animal production has become more focused, using fewer livestock breeds who turn out to be more productive.

According to FAO Chief Veterinary Officer Joseph Domenech those developments have potentially serious consequences for local and global disease risks, which by now, have not been recognised by policy makers. As a result, the vast majority of chickens are now produced in houses with 15 000 to 50 000 birds in the industrialized countries. The trend towards industrialization of livestock production can also be seen in developing countries, where traditional systems are being replaced by intensive units, mostly in Asia, South America and parts of Africa (FAO, 2008). And thus, backyard poultry is decreasing together with indigenous chicken and cockerel production.

2. 0 Literature Review

2. 1 Cockerels

Cockerel coming from the word cock is known as a young cock not having an age older than one year. Cocks are also known as fighters without mercy since centuries. They can mate with 5-6 hens at a time and one cock or cockerel can stay with a family of five to six female birds. Cocks cannot accept another cock in their family, so they fight until one survives and takes possession of the family. So these skills of fighting start developing in early stages of the cockerels. Cockerels also like to be in higher positions from the soil, and thus they are seen on high trees. (Danae Olivier, 1990)

Cockerels the egg-type male chicks' production is an essential component of family poultry development with the increasing trends of commercial layer farming. The layer farmers usually buy female chicks from the hatchery and a significant number of male chicks remains in the hatchery and are sold at a low price or destroyed since there is little or no facility to market these
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chicks. Cockerels can be grown as a source of meat as most consumers prefer cockerels as a source of poultry meat because of its hardness. (Huque Q. M. E. et al, 2004)

Cockerels from strains of laying hens take long period to grow. Despite this, cockerels are present in high number in developing countries where the accessibility and price of day old chicks are frequently constraints. The efficient supply of the animal category is very low in research activities. On the other hand, poultry feed represents 60 to 80% of the cost of inputs in commercial poultry production (Branckaert et al 2000).

2. 1. 1 Fate of cockerels

Domestic chickens produce eggs which hatch giving almost equal proportions of males and females. Long time ago, domestic chickens were bred for both egg and meat production. On the contrary, nowadays, commercial hybrid chickens are selected for one purpose only; either eggs or meat. Surplus day-old male chicks of the layer type are currently without significant commercial value and are at best used as food for e. g. carnivorous animals. All attempts to raise male chicks of the layer type for meat production have resulted in high consumption of feed and poor meat yield which is difficult to market at competitive prices. (Kaleta E. F. and Redmann T., 2008). Due to the inefficiency in producing meat in a short time, they are culled on the first day.

2. 1. 2 Cockerels as a source of poultry meat

Normally cockerels are mostly reared in backyard system and village poultry production. It is a source of income to women in villages, as well as it <https://assignbuster.com/broiler-cockerel-production-in-semi-intensive-system/>

contributes to the food security in villages. In some places cockerels are also used as a barter system instead of money.

2. 2 Broiler Industry

In order to produce a kilogram of broiler meat, 1. 8 kg feed is required (Akabay, 1995) and broilers are one of the most efficient converters of grains to animal protein.

Growth of broilers at the beginning requires investments in significant amounts in the form of broiler houses and buying and storage of feed (Knoeber and Thurman, 1995). Broilers are genetically selected, then slaughtered when only 6 or 7 weeks (a healthy chicken's lifespan is as many years) and never experience maternal care. Mass-produced chickens spend their short lives in huge windowless sheds and since they are motherless they have to fend themselves since day old (Webster J., n. d.). Meat chickens today can reach a weight of approximately 2kg in 35 days while consuming only 3. 2kg of feed. With genetic selection there are still improvements in performance and the time it takes to reach market weight is gradually becoming shorter (Choct M., 2010).

2. 3 Egg industry

2. 3. 1 Trend of commercial egg production

Compared to the broilers, the egg layers take much more time to grow. They can have a lifespan of up to 2 years.

The trends in Mauritius shows that, egg production has been decreasing significantly since 2006, though there have been improved breeds of egg layers, with increasing rate of laying eggs every year.

2. 4 Feeding Difference for broilers

Recently, there has been an unexpected and high demand of certain elements in the feeding of poultry, due to the success of the research scientists in producing birds with enhanced productivity in every way, which overcomes the normal nutritional requirements of broilers. (David Sainsbury, 2000)

2. 5 Cockerel production management compared to broiler production management

There is no recognized cockerel management guide till date, for profitable cockerel rearing and production system. Even then farmers begin cockerel husbandry with great interest for consumer's choice, lower management cost, more organoleptic preference and easy management practices. Many consumers prefer the meat of the male chicks at a body weight of 600g to 700g and thus there is a better plan for the utilisation of the vast quantities of male chicks (Huque Q. M. E. et al, 2004).

2. 6 Cockerel performance compared to broiler performance

2. 6. 1 Feed efficiency and growth rate

The growth rate is linked mainly to genetic factors, where the expression depends on environmental features (Gerken et al., 2003).

2. 7 Market demand and consumer choice of preference for cockerel compared to broiler

2. 7. 1 Meat quality

The meat quality of cockerels is considered to be hardier than the broiler meat. The taste, flavor, juiciness and tenderness are more or less alike to the indigenous stocks. Due to its excessive abdominal fat properties, the broiler meat is less appealing if consumers have to choose between broiler meat and cockerel meat (Crawford, 1990). This can be considered as a great advantage for the rapid expansion of cockerel rearing in remote areas. The meat from male chicks of layer strains is believed to be more suitable for the preparation of chicken delicacies because of less abdominal fat property, juiciness and most importantly the desirable flavour of the meat. Due to its smaller size, recently there has been a great demand of cockerels in restaurants, hotels and consumer demands where both restaurant holders and consumers are benefited which is creating a prospect for cockerel production. (Haleem, 1987)

2. 8 Types of production systems

In Mauritius we have 4 types of production systems which are the:

- Industrial system
- Intensive system
- Semi intensive system
- Backyard production system

2. 8. 1 The intensive system

The industrial system of production also form parts of the intensive system, where there are very large quantities of chickens are present in the grow-out farms. Food And Allied Limited is one of private companies which operate on an industrial system of production.

In this kind of production animals are kept in a fairly small area or at a high stocking density and the level of administration and inputs involved are high in this system of production. Though this system of production is completely dependent on use of concentrates manufactured locally, the raw materials are imported. The birds are under constant veterinary monitoring. All veterinary products including vaccines are imported. The birds are kept in large buildings where most favorable conditions are maintained and reared on the deep litter system (FAO Country Report, 2007)

2. 8. 2 The semi-intensive system

The stocking density is lesser in the semi intensive system compared to the intensive system of production but the level of management and inputs are low. In this system the birds can be of broiler type or layer type. They are fed concentrates and have little veterinary care. They are usually kept on deep-litter but on a small-scale and at the back of the house. They are fed concentrates and have little veterinary care. The birds are mostly kept in concrete buildings but the environment prevailing inside is very often poor. The products which are the eggs and meat from these farms are generally sold to the public in the locality through some middlemen (FAO Country Report, 2007)

2. 8. 3 The backyard/extensive system

In the backyard system all the birds are kept in the backyard and there is no input or if present, it is at a very low level. It also includes those units where the animals are left to roam and look for their feeds. In this system of production, the local chickens roam and look for food. There is a minimum of inputs, usually consisting of small amount of concentrates and in some cases of kitchen leftovers. There is no veterinary care provided and production is very low. Nevertheless the products from this system of production usually fetch a higher profit than those from commercial firms, both in case of meat and eggs (FAO Country Report, 2007). In the villages, the birds normally spend the night on trees in the backyard. Backyard poultry are the predominant livestock species in many rural areas of the developing countries and comprise mainly local unimproved poultry breeds and few improved strains. (Ahlers et al 2009) Backyard poultry production plays an important role in poverty alleviation and improvement of family food security in many poor rural households of the developing countries. (Adongo 2004)

In the year 2002, it was estimated that around 1000 farmers are involved in backyard family poultry production consisted of around 1000 farmers in Mauritius, and around 4000 in Rodrigues. The farmers in Rodrigues rear indigenous scavenging chickens, which are known as the ' local' breed, most probably a mixture of Rhode Island Red, Australorp and Naked neck breeds which were brought on the island a few centuries ago. (Jugessur, V. and Pillay, M. (2002)

2. 9 Nutrition of birds

2. 9. 1 Water

Water is the most important nutrient for poultry as a shortage of water supply may affect the bird's performance more quickly than a shortage of any other nutrient. Water is important in digestion and metabolism of poultry. The body of the bird comprises of 55 to 75% of water. There is a strong relationship between feed and water intake. Water softens feed in the crop to prepare it for grinding in the gizzard. The chemical reactions involved, require water to facilitate the processes of digestion and nutrient absorption (Damron B. L. and Sloan D. R., 2003).

2. 9. 2 Nutrients

2. 9. 2. 1 Proteins

Proteins, Fats, Carbohydrates, Vitamins and Minerals

The main sources of protein for poultry feeds are animal proteins such as fish meal and plant proteins such as soybean meal and corn gluten meal. On a dry-weight basis, the body of a mature broiler is more than 65% protein (Damron B. L. and Sloan D. R., 2003).

2. 9. 2. 2 Fats

Fats are important sources of energy for poultry diets because they contain twice the energy as any other feed ingredient. This characteristic makes fat an important tool for the proper formulation of starting and growing diets. Fat makes up about 17% of the dry weight of a market broiler (Damron B. L. and Sloan D. R., 2003).

2. 9. 2. 3 Carbohydrates

Carbohydrates make up the largest portion of a poultry diet. They are usually in the form of sugar, starches or cellulose. Carbohydrates are a major energy source for poultry and some important sources of carbohydrates can be obtained from grains such as corn, wheat, and milo (Damron B. L. and Sloan D. R., 2003).

2. 9. 2. 4 Vitamins

Vitamins are essential for life and they must be provided in proper quantities for chickens to grow and reproduce. Although some of these vitamins are abundant in feed ingredients, a vitamin premix is usually used by the nutritionist to ensure adequate strengthening of the birds.

The most widely recognized use of minerals is the formation of straight, strong and rigid bones (Damron B. L. and Sloan D. R., 2003).

2. 9. 2. 5 Minerals

Laying hens also need minerals, primarily calcium, for eggshell formation. As grains are low in minerals, poultry feeds are supplemented with with sources of minerals (Damron B. L. and Sloan D. R., 2003).

2. 9. 3 Feed Additives

Poultry feeds often contain substances that are not concerned with nutrient requirements. For example, an antioxidant may be included to prevent rancidity of the fat in the diet, or to shelter nutrients from loss by oxidation. Pellet binders may be used to improve the texture and firmness of pelleted

feeds. Coccidiostats are often used in broiler feeds (Damron B. L. and Sloan D. R., 2003).

2. 10 Feeding strategies

Ojewola G. S. And Ozuo U. K., 2006 carried out an experiment with cockerels of five weeks old by substituting Soyabean meal with palm kernel meal at different percentages of 0, 25, 50, 75 and 100%. Palm kernel meal is a by-product of palm oil extraction (Tewe O. O., 2003) and is abundant in many tropical regions (Onwudike O. C., 1986). Inclusion of 20% of palm kernel meal in the feed of cockerels was the best scenario in terms of weight gain and economic performance (Ojewola G. S. and Ozuo U. K., 2006).

2. 11 Litter management

There two systems of litter management, which are the deep litter system According to David Sainsbury, shavings should usually be placed at a depth of 150 mm or another material can be placed at the same depth. He also suggests that it is better to place the shavings at a depth of 70 mm and the rest to be put later. The litter should not be allowed to be caked. The addition of litter at a later stage dilutes the birds' droppings, thus enhancing the activities of the birds. A high level of ammonia is dangerous for all birds at any age. It may cause respiratory problems later leading to blindness. (David Sainsbury, 2000)

The advantages of the deep litter method are:

- It can be managed quickly and easily.
- It can be used as compost in the end.

- The birds get to scratch through the microbes and useful culture of the living compost litter material, which is beneficial for them.
- It is safe and the birds stay healthy (Ware L., 2011.)

2. 12 Health and diseases

Farmers consider that the cockerels are less vulnerable to diseases compared to broilers (Sil et al., 2002)

2. 13 Heat stress

Heat stress has been one of the major problems which the broiler industry is facing in the tropical and subtropical areas. This is because broilers can only attain the desired final live weight in a stress free environment (Sabah et al., 2008). When exposed to high temperatures, broilers exhibit many behavioural changes which allow them to re-establish heat balance with their surroundings (Gray et al. 2003). But according to Fuquay (1981), in hot environment importance should be placed on diets to raise intake or alter the levels of proteins, amino acids or other nutrients to increase the conversion of feed to meat (Onu P. N., 2009).

2. 14 Mortality

Early mortality in bird flocks may occur due to failure in adapting to the new environmental condition, disease, or disappearance of yolk sac in the intestine. Sometimes inaccessibility to feed and water the chicks do not begin to eat and drink, they may survive for few days with the yolk sac but once depleted, the chicks will soon die (Tabler, Berry and Mendenhall, 2004).

These data show that broiler mortality usually peaks at approximately 3 to 4 days after placement, declines until approximately day 9 or 10 then stabilizes until approximately day 30. (Tabler, Berry and Mendenhall, 2004).

2. 15 Conclusion

Mehthodology

Types of poultry industries (broiler and egg layers)

What are cockerels (nature, behaviour)

Fate of cockerels

Broilers

CSO stats on status of cockerel production and poultry production for the last 10 yrs

Trends of egg layers produced, will give information on day old cockerels produced.

Cockerel breed

Number of small scale cockerels producers through extension services

Broiler breed

Systems of production

Organic farming

Traditional chicken production

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Organic feed in case of cockerels

Performance of cockerels

Normal growing requirements of broilers

Brooding and rearing conditions

Space requirements

Vaccination and sanitation

Ventilation in growing poultry farms

Consumer preference towards meat quality and quantity

Energy, vitamin and protein requirement of poultry

Price of maize going high in the world market

Banning of feed additives

Growing chickens in tropics

Body weight and FCR

Slaughtering age of cockerels and broilers

Litter analysis (moisture content)

Village chicken production

Advantage of intensive production

Advantage of organic poultry

Cost effectiveness

CRD design in placing chicks