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Review Article

Duck Production: Has a Potential to Reduce Poverty among Rural Households in Asian Communities – A Review

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ABSTRACT

Duck production plays an important part in the agricultural economy of many Asia countries. The continent alone accounts for 82.6% of the total duck meat produced worldwide. Not only is Asia involved in duck production but also duck meat, eggs and their products are relished and consumed by many Asians. In spite of this, intensive education to empower rural households to increase duck production is limited. In recent times, much emphasize is being laid on commercialization to increase production at the neglect of rural household production. Subsequently this can affect the income levels of many rural households in Asia countries with the potential and can take the advantage to engage in duck production should they have been given adequate training and education. Poverty alleviation among rural communities had involved a number of strategies including women empowerment, promotion of crop, poultry and livestock production, and various activities of governmental and non-governmental organizations geared towards community development. Considering the population, importance and prospects of duck production in Asia, this mini review discusses the potentials duck farming has in reducing poverty level among rural communities in Asia.

Keywords: Duck production, poverty alleviation, rural household

INTRODUCTION

Ducks are waterfowls closely related to geese and swans. They belong to the order Anseriformes, family Anatidae and occur on all the continents except Antarctica (Anonymous, 2011a). Characteristically, they have broad bill, webbed feet, are widespread in many types of aquatic habitats and mostly breed in freshwater habitats such as shallow lakes, marshes and swamps (Anonymous, 2011a). Most ducks are descendents of wild Mallard while minority is descendents of Muscovy.

It is not known exactly when ducks were domesticated but there is evidence that the ancient Egyptians use ducks for sacrifice (ca. 1353-1336 B.C.) and probably bred them for food (Anonymous, 2011b). The Southeast Asians were also raising ducks in captivity prior to 500 B.C. (Anonymous, 2011b). The speciality of duck meat in Asia can be traced as far back as 600 years ago where Pekin duck meat formed part of the main dish of the Chinese Emperor and a delicacy for members of the ruling class (Anonymous, 2011c). At that time, best cooks from all over China gathers at Beijing to cook (duck roast) for the Emperor and the top cook could reach the rank of a minister (Anonymous, 2011c). In recent times, duck meat is still very popular especially among many Asia countries such as China, Hong Kong, Japan Korea and Taiwan.

Ducks have better adaptation to various environmental conditions compared to chickens. They are hardy and can re-stand a number of diseases. They can also scavenge on their own and require less man power to keep. Breeding and selection have led to the improvement of duck breeds. Breeds that have faster growth rate are efficient feed converters and have better meat quality have been produced. Pekin ducks, Muscovy, Khaki Campbell, Indian Runner and mule ducks are among the duck breeds popularly raised for their meat and eggs. Duck meat and eggs are important source of protein and iron (Tai and Tai, 2001; Adzitey et al., in press). Ducks can also be used for decorations purposes, for clothings, to control water snail in rice fields and hunted for as a game animal (Gallebu et al., 1992; Adzitey et al., in press). Tai and Tai (2001) reported that with high quality processing technology, Taiwan exports USD 130 million worth of down feather products annually.

Duck production has since been dominated by Asia. Current report on main duck meat producer countries indicates that, 8 countries from Asia are among the top 15 countries worldwide (FAO, 2010).

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Over the years duck production also tend to increase in these Asian countries. This indicates the importance, opportunities, potentials and prospects of duck production in Asia. If duck production is tap at the rural level, it will provide employment and a source of income for the rural poor. This mini review highlights the avenues and the potentials of duck production in Asia as a means of reducing poverty among the rural poor. These are discussed under 1) availability of breeds, 2) duck production systems, 3) availability of feedstuffs and 4) duck meat production and consumption. In this paper communities and households are used interchangeably.

Availability of exotic and local breeds

Duck breeds commonly used for meat production, egg production or for both purposes are readily available. As mentioned earlier on, exotic duck breeds such as Pekin, Muscovy, Khaki Campbell, India Runner and mule are widely used for meat and/or egg production and are readily available in Asia. In recent times, numerous studies have been carried out to improve upon the growth, production performance and nutritional quality of these breeds. It has been reported that the modern domestic White Pekin duck perform better than the modern broiler chicken in terms of weight gain and feed efficiency to the same live weight due to genetic improvement (Zhou, 2011). The meat quality and physiochemical characteristics (such as dressing percentage, water holding capacity, colour, texture, pH, fatty acid and amino acid compositions) of exotic duck breeds are still intensively under research to improve upon them. Foreign companies like Cherry Valley, Grimaud and Maple leaf have extended their breeding stocks to many Asian countries, co-operated with local and industrial firms to produce quality ducklings for both local and commercial farmers (Tai and Tai, 2001).

Local breeds such as Bai, gaoyou, Jingdin, Liancheng, Shanma and Shaoxing in China (Ma and Zhao, 1998), Itik Jawa in Malaysia, Alabio and Tegel in Indonisia, Desi in India and Bangladesh, and Tsaiya in Taiwan (Tai and Tai, 2001) are also readily available. These indigenous breeds are well adapted to the harsh and hardy environmental conditions of Asia. They can feed on their own (foraging), live on local available feedstuffs, tolerate common environmental diseases and requires less skill to rear them. It is quite obvious that most people prefer things from their locality or society, but the performance traits of these breeds hamper their use for egg or meat production. Therefore there is the need for Asia governments, scientists, concerned organizations and all stakeholders to work towards improving the performance characteristics of these indigenous breeds while maintaining and conserving their genetic diversity. Rural communities can take advantage of the readily available duck breeds (both improved exotic breeds and indigenous breeds) to farm ducks and/or increase their production. There is already market for duck meat and eggs in Asia, therefore farming ducks can provide rural households jobs and income. It will also reduce government spending on having to import duck meat, eggs and products.

Established duck production systems

Ducks are normally raised either under the intensive, semi-intensive, or extensive system. Commercial duck farming is becoming more popular in Asia because of the increase demand for duck meat, eggs and products. Duck production on small scale has been practised for many years among Asia communities. A well-known and established system, is the traditional 'duck-cum-rice system' or 'duck-cum-fish system' (Farrell, 1997; Setioko, 1997; Rajasekaran, 2001; Tai and Tai, 2001). This system involves the integration of duck production with rice cultivation or fish farming. A symbiotic relationship exists between ducks and rice cultivation or ducks and fishes. The technique and knowledge is readily available, known and practised by Asian communities engaged in duck production for centuries. It means that, little training and education is needed for such rural communities to improve upon this system to increase production to better their livelihoods. Tai and Tai (2001) reported that the traditional duck-cum-rice system is different among many Asian countries. This confirms the existence of and some differences in this system, and how common and familiar it is among Asian countries.

This system adds other advantages to rural farmers. Ducks provide manure which can be used to improve soil fertility of agricultural lands. The manure can also be used as a source of organic matter in fish farming to improve the growth of both phytoplankton and zooplankton that serve as food for fish. Duck droppings can encourage the growth of aquatic snails, worms and other aquatic fauna and flora that act as feed for ducks. This system has also been reported to increase productivity, ensure efficient use of water, spread economic risk of price fluctuation, has minimal environmental impact and a good system for sustainable agriculture (Tai and Tai, 2001). There is some evidence that fish-duck production system played a role in improving food security, nutrition and income level among households in South Indian who were involved in fish-duck production compared to households which were not (Rajasekaran, 2001).

Availability of feedstuffs

Feed is one of the most important factors to consider in any farming venture. Feed alone constituent about 70% of total production cost (Singh et al., 2009). In commercial duck production, importation of feeds, feed ingredients and supplements is common. This increases production cost and will not favour rural duck producers who cannot afford manufactured feed ingredients and supplements. Nonetheless, rural duck producers can depend on the naturally ability of ducks to increase their production. These abilities include good foragers and scavengers; thrive well on locally available feeds, hardy and tolerant to harsh environmental and disease conditions compared to chicken. Under the traditional systems of duck production, ducks can scavenge on their own to obtain the necessary nutrients needed for their growth. By this feed supplementation (manufactured) can be avoided and subsequently reduction in feed cost.

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Non-conventional feedstuffs have been demonstrated to be valuable feed for poultry (Men et al 1995; Adzitey et al., 2010; Dei et al., 2010). Asian rural communities obtain abundant non-conventional raw materials and by-products such as copra meal, pea nut meal, palm kernel, rice bran, broken rice, finger millets, groundnut cake, sesame cake and many more as by-products from their farming activities. These materials are readily available and can be used cheaply to feed ducks. This also reduces the problem of agricultural waste disposal and help convert by-products to meat and proteins. In the duck-cum-rice or duck-cum-fish integrated system, supplementing duck feed with local feedstuffs could increase the efficiency of traditional duck-raising significantly (Setioko et al., 1994). Dong et al. (1997) reported that by using local feed resources efficiently to feed Muscovy ducks, poor farmers (in some Villages in Vietnam) had good profits and that contributed to improving their living standard. Nho and Tieu (1997) found that feeding Khaki Campbell on locally available feedstuffs had no adverse effect on egg productivity. These studies suggest that locally available feeds can be use freely for duck farming to reduce feed cost and to help improve the livelihood of rural households.

Duck meat production and consumption

Duck population like chicken and other poultry species has been increasing over the years due to the demand for poultry meat, eggs and products. Global duck meat production from 2000 (2,882,400,000 kg) to 2008 (3,780,000,000 kg) rose by 31% (FAO 2010). Of the total duck meat (3,780,000,000 kg) produced worldwide in 2008, 83% (3,121,900,000 kg) was from Asia. Table 1 shows duck meat production in Asia and other countries within five years beginning from 2005. The continent experienced increased duck meat production each year partly due to contribution from China. China alone produced more than half the total duck meat produced worldwide. Malaysia, Thailand, Vietnam, Myanmar, India Korea Republic and Indonesia are the 3rd, 4th 5th, 6th, 7th, 9th and 11th, respectively in world duck meat production. All these Asia countries also experienced a steadily increased production within the first three years expect in Vietnam (Table 1). Furthermore, most of these countries have maintained their production within the last two years. China, alone remains unaffected and has experienced increased in duck meat production within the past five years. There is the opportunity for expansion in duck production especially in Asia countries without growth within the past two years of which rural communities can have a role to play. Asia also has comparative advantage in duck production compared to other continents.

Table 1: World duck meat production (kg) by individual countries within the past five years beginning from 2004

Country	2004	2005	2006	2007	2008
China	1950300	215000	2175300	2328200	2518200
France	238100	233800	233400	246800	248600
Malaysia	102000	107000	108000	111000	111000
Thailand	84800	85000	84900	84900	84900
USA	79000	85100	85600	83400	84000
Vietnam	88200	88200	86000	84000	84000
Myanmar	58300	60500	67900	74200	74200
India	65000	67600	70200	72800	72800
Germany	37000	40100	38500	55800	60800
Korea republic	46000	52000	53000	57000	54000
Hungary	48100	53100	44500	51400	51400
Indonesia	22200	21400	24500	44100	45200

Source: FAO (2010)

Duck meat, eggs and products have large market especially in Asia and other countries. Duck meat has traditionally played an important role in Chinese food culture and current trend indicates a growing demand (FAO, 2010). Duck meat, eggs and parts are used to prepare many specialized and value added products such as roasted Pekin duck, crispy duck skin, ginger-root duck, herb duck, pressed salt duck, smoked duck steak, duck roll, tea smoked duck, salted duck eggs, thousand year duck eggs, balut, salted duck gizzards, marinated duck tongues, and many more which are largely consumed in Asia (Tai and Tai, 2001). Rural communities in Asia countries can take advantage of this to engage in duck production or increased their production for those already involved in duck production. This will create jobs and bring incomes that can contribute to reducing poverty among rural households.

CONCLUSION

Duck production has great potentials in Asia countries. These potentials can be tapped to reduced poverty at among rural households or communities. There are readily available exotic and local breeds of

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ducks for production. The knowledge of traditional duck production is already established in Asia. Asia has comparative advantage in duck production, and dominates in duck meat production and consumption

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