



## Sustainability of Chicken Meat Production in achieving Food Security in Malaysia

<sup>1</sup>Nur Syahirah Samsuddin, <sup>2</sup>Amir Hamzah Sharaai and <sup>3</sup>Mohd Mansor Ismail

<sup>1,2</sup>Faculty of Environmental Studies, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

<sup>3</sup>Department of Agribusiness and Informative System, Faculty of Agriculture, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

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### ABSTRACT

**Background:** Chicken meat is vital in Malaysia since protein-based food is needed in human's diet and the meat is socially and religiously acceptable by Malaysian. Hence, in order to ensure sufficient supply of chicken meat at affordable price either for present or future consumption, sustainable chicken meat production is needed. **Objectives:** The aim of this paper is to discuss the framework of sustainable chicken production in ensuring food security. **Results:** Chicken production industries in Malaysia had rapidly increase due to the increase in demand for consumption. Demand of halal food and increase in cost of living is a main issue of food security in Malaysia. **Conclusion:** Thus, the sustainable production framework in poultry production had been importance in combating the food security issues in Malaysia.

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## INTRODUCTION

Malaysia becomes self-sufficient in poultry meat production, which consists of chicken, ducks and quails, and the overall production is able to meet the domestic demand in Malaysia. Although Malaysia has become self-sufficient in chicken meat production and other poultry meat production, there are serious concerns regarding the long-term sustainability of intensive farming systems [1][2][3][4][5][6]. Chicken is the second staple food after rice, which provides a source of protein necessary for Malaysian diet. Another reason why chicken becomes a staple food among Malaysian because the price of chicken is cheaper than beef and pork, and chicken prices have been more consistent. Chicken meat is normally served with rice. Thus, rice and poultry meat are the most important staples to Malaysian.

Poultry meat production is a part of agriculture activities and according to Dr. Greg Thoma from the University of Arkansas, sustainable agriculture activities can be defined as the one that will meet the needs of the present while enhancing the ability of future generations to meet their needs, increasing productivity to meet future food demands, decreasing impacts on the environment, improving human health, as well as improving the social and economic well-being of agricultural communities. Therefore, chicken production in Malaysia is closely related to the increase in population. As the population expands, it is increasingly important that humans consider the long-term environmental consequences of their economic decisions in keeping with the availability of chicken for Malaysian domestic use at reasonable price and at the same time ensuring sustainable production of chicken either in the present or for the future generation.

In the chain of sustainability of poultry meat production, food security is the hot topic that is discussed nowadays in developing countries such as Malaysia. The sustainability in poultry meat production is important particularly in achieving Malaysian's food security. There are a few definitions regarding food security from several reliable resources. According to FAO 1996, food security is defined as access by all people at all times to enough food for an active and healthy life and contains three major components of; 1) adequacy in food production, 2) stability in food supply and 3) physical and economic access by vulnerable groups. Meanwhile, according to the National Special Programme for Food Security, food security exists when all people at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and preference for their healthy lifestyle.

**Corresponding Author:** Amir Hamzah Sharaai. Faculty of Environmental Studies, University Putra Malaysia, 43400 Serdang, Selangor, Malaysia  
E-mail: [nursyahirahsamsuddin91@gmail.com](mailto:nursyahirahsamsuddin91@gmail.com)

Since chicken is a staple food in Malaysia, it is necessary to ensure sustainable chicken production in the context of achieving food security in chicken production either for present or future consumption. Therefore, this paper aims to discuss the framework for sustainable chicken production in ensuring that food security is achieved in Malaysia.

#### Methodology:

This study had been conducted by document analysis from previous study in three scope of studies; poultry production, statistic data on chicken production, sustainability concept, and food security. Those studies had been integrate together to build on the framework for sustainable chicken production.

## RESULTS AND DISCUSSION

#### The Development of Chicken Production:

In Malaysia, chicken production development started in year 1950 involving backyard farming activities. The rapid development of chicken production started after effective vaccination for New Castle disease which was found in year 1947. From year 1999 to 2003, chicken had a significant production, in which 94% of poultry production in Malaysia consisted of chickens, followed by ducks with about 5% of the total poultry production, where geese, turkeys and quails were about 1% of the total poultry production [7].

**Table 1:** Distribution of Broiler Parent Stock Company in Malaysia.

Region	Number of Company
Northern (Kedah, Perlis, Penang, Perak)	8
Central (Selangor, N. Sembilan, Melaka)	6
Southern (Johor)	6
Eastern (Pahang, Terengganu, Kelantan)	3

Data sources; Provisional, Department of Veterinary Services

About 23 broiler parent stock companies, 10 integrators and 13 non-integrators for chicken production industries were recorded in Malaysia in year 2012. Among integrator companies available in Malaysia according to the Department of Veterinary Services (DVS) are Kentucky Fried Chicken, Chareon Pokhphand, Goldkist, Leong Hup, Cargill and Malayan Flour Mills.

**Table 2:** Total Number of Chicken Meat Production from Year 2010- 2013.

Year	Chicken				Total
	Broiler	Laying	Breeder	Village	
2010	148,304,515	42,355,738	15,107,501	11,459,713	217,227,467
2011	157,605,416	49,520,194	11,808,436	13,935,095	232,869,141
2012	170,273,718	52,762,461	11,925,339	16,195,822	251,157,340
					268,242,584

Data sources; Provisional, Department of Veterinary Services

According to DVS records, broiler chicken production increased slightly from year 2010 until year 2012 about 12.9 % where the number of production from 148,304,515 increased to 170,273,718 and about 79 farms conducted the operation in year 2012. The quantity of production shows that the demand for chicken was higher throughout the year. This is because chicken is already acceptable in all Malaysian culture and there is no exception for chicken meat intake, such as Muslim which avoids eating pork and Buddhist which avoids eating beef.

Farming activities of broiler chicken are able to support either the domestic demand of Malaysian or other countries that import chicken meat from Malaysia. In year 2012, about 13.82 million tons of chicken meat were exported. There was a slight increase from year 2009 until 2011 for broiler and chicken meat production. A fluctuation occurred in year 2012 due to the H5N1 diseases that spread in poultry production in Asian countries. Most of the special chicken meat cuts were imported from China, which amounted to 22,726 metric tons, followed by Thailand and Holland (Table 3).

**Table 3:** Sources of Imported Broiler Chicken Meat.

Sources	2010	2011	2012
China	75.10	78.00	55.07
Thailand	12.15	18.04	39.97
Denmark	9.50	2.3	1.61
USA	0.54	1.1.2	0.31
Holland	2.71	0.48	3.05
France	0	0	0
Sabah	0	0	0
Sarawak	0	0	0

**Table 4:** Statistic on Export Broiler Parent Stock and Chicken Meat.

Year	2010	2011
2009	43.08	0.92
2010	44.93	4.16
2011	46.07	10.60
2012	42.78	13.82

Data sources; Provisional, Department of Veterinary Services

In Malaysia, there are several initiatives that have been done by the government in order to ensure sustainable chicken meat production. Poultry meat production had been expected to grow at moderate rate of 2% annually with forecasted net annual production of 1.44 million tons. A-Z contract scheme in chicken farming is one of the alternatives in ensuring the continuous availability of chicken supply in the present and also for the future. This scheme also provides jobs opportunity for new entrepreneurs. Besides that, there are a few agencies and departments under the Ministry of Agriculture who assist entrepreneurs in chicken production, such agencies are the Department of Veterinary Services (DVS), Farmer's Organization Authority (LPP), and Malaysian Agricultural Development Authority (MADA) who provide training, disseminate information and offer financial support towards the development of chicken production in Malaysia. Thus, the well-established government agencies are given the task of ensuring the development of poultry supply chain are able to increase the tendency for sustainable chicken production in terms of availability and affordability in order to meet the demand and supply in Malaysia to achieve food security.

#### *Food Security Challenges of Chicken Production in Malaysia:*

Based on the previous studies that have been conducted in food security, Malaysia has been focused on self-sufficiency in rice production [8][9]. The authors conclude that there are several factors that contribute to food insecurity, such as low income of household instead of increase in the number of household and increase in living expenses, challenges in constructing consistent and viable policies and strategies in food security, as well as climate change. Based on the Tenth Malaysia Plan, food security will be strategically addressed to ensure availability, affordability and accessibility of food, which mainly focuses on rice production.

Even though food security has been the focus since the First Malaysia Plan, but it is still new since there is no specific policy on food security that has been made. There are a few challenges on food security in Malaysia. One of the issues is regarding the accessibility of halal food especially in chicken production. Since 60 % of Malaysian citizens are Muslim, therefore there is a huge issue if the chicken production does not meet the halal standard. There is an insecure condition in which certain chicken processing companies did not meet the halal standards for chicken slaughtering as has been stated by the Malaysian Standard Halal Food Production, Preparation, Handling and Storage, General Guidelines (MS1500; 2009). Malaysian Standard Guidelines for Halal Food has been developed to provide a practical guidance for the food industry on the preparation and handling of halal food (including nutrient supplement) and to serve as a basic requirement for Halal food product and food trade or business in Malaysia. In terms of food security, this standard guidelines act as a tool for providing accessibility and availability of halal food in Malaysia.

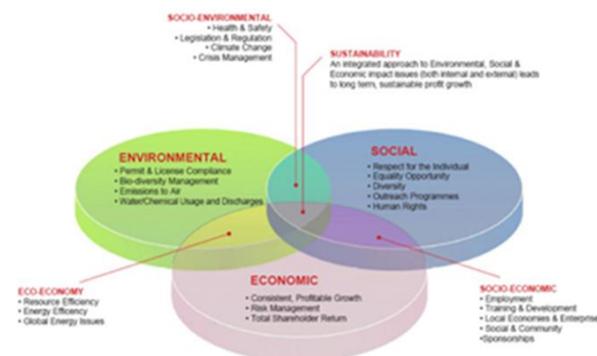
Besides that, a reduction in fuel subsidies, depreciation of Malaysian ringgit, and implementation of minimum wages in 2013 are all factors that have led to higher production costs in 2014 for poultry production in Malaysia (USDA). As the cost of living increases, it tends to cause poor diet quality among food-insecure households, which could be attributed to the lack of availability and accessibility of food, or the cultural practices and beliefs that limit food choices [10]. Based on the previous study on food security, low socioeconomic status of the household is mainly the factor that contributes towards food insecurity [11][12][13]. Thus, the increase in the cost of living will also become a contributing factor towards food security dilemmas in Malaysia in terms of accessibility of nutritional food intake, especially in rural area with lower household income compared to the household income in the city.

In year 2003-2004, the emergence of H5N1 from Asia to Europe adversely affected trade and poultry production since several death cases in animals and human cases were recorded either in the country or internationally. According to the Ministerial Functions Act 1969, Ministers of the Federal Government Order (NO 2) 2004, Department of Veterinary Services (DVS) have a responsibility for controlling the import and export of livestock and animal produce and quarantine services. Hence, it shows that Malaysia is really committed in ensuring the safety of livestock and animal towards consumers either while entering or leaving Malaysia. Besides that, an increasing number of consumers demanding health and natural foods have favoured organic livestock farming that is reputed to be environmentally friendly, sustaining animals in good health, with high welfare standards and resulting in high quality products [14]. This is congruent with DVS role in monitoring animal welfare, especially for livestock farming from spreading diseases, proper handling including hygiene, as well as nurturing to ensure animals for consumer consumption will be in good condition and provide sufficient nutrition need for their diet.

### *Importance of Sustainable Chicken Production towards Food Security in Malaysia:*

Based on the issues that have been highlighted in food security, there are two main factors that affect the accessibility of chicken among Malaysian; the rise in cost of living and also the increase in price due to the increase in production costs of chicken. The issues stress the need for sustainable chicken meat production in maintaining cheaper source of protein among Malaysian. This is necessary to ensure the availability and affordability of chicken for future generation in all socioeconomic status. According to the Malaysian Population Statistics, there will be about 38.6 million people in Malaysia by year 2020, and this means that the population of Malaysian tends to increase significantly throughout the year. At the same time, it puts pressure on food security especially in the availability and affordability of chicken due to the rise in demand. Hence, the plan for sustainable chicken production is necessary to be carried out to ensure uninterrupted supply of chicken meat.

Sustainable production means the creation of goods and services using processes and systems that are non-polluting, conserve energy and natural resources, economically viable, safe and healthy for workers, communities, and consumers, as well as socially and creatively rewarding for all working people [16]. Based on the statement made by Lowell Centre, it shows that the sustainable production of goods must be consumer friendly, eco-friendly, socially acceptable and have their own novelty. By referring to the sustainability concept that the environment becomes a large single system that provides resources, shelter and food sources to human beings, in the environment there are a social system inside an environment system; a tribe of people which forms their government for their own welfare either in continuing life through the development of economic systems based on the input obtain from the environment or their social interaction aspect. Hence, through this ideology, it shows that environmental sustainability must be the highest priority, since an environment system delivers services to the internal system. Therefore, based on this ideology, for sustainable chicken production, the environment that provides the chicken as a food source must be able to maintain high productivity of chicken for food supply purposes.



**Fig. 1:** Sustainability Concept Diagram (Source; Samuel, 2009).

Since chicken is one of the food sources that are needed by human beings, sustainable chicken production is necessary for food security. The accessibility of chicken supply can be achieved through these three systems (3 pillars of sustainability) that have been mentioned previously. In terms of social, the accessibility of food depends on socioeconomic status and national food stocks. In this condition, politics especially in policy development and also economic growth (increase in cost of living, tax, and others) play important roles. Availability of food supply means the affordability of household in getting the supply either for household or individual diet intake that is sufficient in terms of nutrition content. This component also bears the concept of sustainability in which social (number per household) affects the availability of sufficient food sources according to the right nutrition intake and also the affordability of household in providing food sources and healthy food including hygiene aspect. This depends on economic status of the household and environment condition. Through sustainable production, continuous supply of nutritional food sources is able to be accessed by all socioeconomic status. Furthermore, the quality of food sources especially in hygiene aspects, health for consumer and worker have been applied through eco-friendly work culture. Sustainable production also ensures higher productivity in production but fewer impacts towards the environment. In short, sustainable production is necessary in achieving food security for chicken meat production since the demand for chicken meat among Malaysian is expected to increase gradually day by day.

### *Conclusion:*

According to the Statistics Department, it is projected that Malaysia's population will reach almost 40 million in 2040 and the world population will reach 9 billion. Continuous population and consumption growth

means that the global demand for food will increase for at least another 40 years [14]. Thus, this situation will stimulate food prices as greater percentage of the disposable income needs to be spent on food. This has been proven by the increases in the number of chicken production from year 148 million birds in 2010 to 170 million birds in 2012, which clearly shows increased production to meet increased demand.

Besides, the challenges in ensuring food security become most important strategies in developing countries. In order to address food security issues, the obvious solution is to implement sustainable production. Sustainable production is expected to offers continuous and higher productivity, and as well as reducing adverse impact towards environment. The adverse impacts of livestock production have received increasing attention over the last few years because it appears to have a major impact on the environment as livestock needs to compete for scarce resources such as land, energy, and water.

Concentrated chicken industries in Malaysia may contribute to a larger negative impact towards the environment even though the environmental impact of chicken meat production is expected to be lower compared to swine and cattle production. For this reason, sustainable production is anticipated to overcome the environmental impact produced by concentrated chicken production. New technologies have been invented towards sustainable production. For example in processing phase, the use of High Pressure Low Volume (HPLV) spray decreases water consumption, and by reducing water consumption, the dissolution of pollutants is reduced, leading to reduced sludge generation in the effluent treatment plant (and consequently reduced disposal costs)[15].

In order to ensure food security in chicken meat either for present or future consumption, sustainable production must be taken seriously. However, the implementation of sustainable production is not without costs. It is expected that the total cost of production will increase when the sustainable production is implemented. Thus, this relationship between costs and sustainable production need to be further researched in order to help enhance food security for chicken meat production. The importance of agriculture policy as an outcome from this research is expected to strengthen the strategic policy on food security and it is hoped that this study will able to help in ensuring food security chicken meat production.

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