

Strategic Approach in Cattle Breeding: An Important of Sharia Compliance in Artificial Insemination Implementation in Malaysia and Indonesia Cattle Beef Industry

Ahmad Shabudin Ariffin¹, Hasrul Hashom^{2,*}, Oktora Dwi Putranti³, Abdul Salam⁴ and Azizi Ahmad⁶

¹ Faculty of Business & Science Management, Kolej Universiti Islam Perlis, Malaysia

² Centre of Language & General Studies, Kolej Universiti Islam Perlis, Malaysia

³ Faculty of Agriculture, Animal Husbandry Study Program, Universitas Khairun, Ternate, North Maluku, Indonesia

⁴ Faculty of Islamic Studies, Kolej Universiti Islam Perlis, Malaysia

⁵ Kedah Corporation Plantation Group (KLPK) Sdn Bhd, Malaysia

Abstract. Cattle beef is very important as a protein source to the population of a country. However, the existing demand for beef is greater than its supply making it a critical issue in food security. Moreover, the price of domestic beef per kilogram is higher than imported beef. The use of innovations such as artificial insemination, biosecurity, and integration techniques is yet to be implemented by beef cattle producers although empirically proven to improve beef production. This situation has become more critical among beef producers in Malaysia. Based on the insufficient supply of cattle beef in the country, Malaysia through its industry players like Kedah Corporation Plantation Group (KLPK) decided to introduce a new breed by using artificial insemination technology so that the prime product can be sustained in the future. This concept paper will highlight the strategic approach in cattle breeding by using qualitative methodology to gather knowledge sharing and technology transfer as a comparative implementation between Malaysia and its counterpart in Indonesia. This study aims to explain a strategy approach between both players and the Sharia compliance issue regards the implementation proposed by the study.

1 Introduction

Malaysia aims to emerge as one of the cattle-beef halal compliance hubs, guided by the Sustainable Development Goal (SDG); a global effort driven by the United Nations. The spirit of the goal is considered a key framework for Malaysia in its struggle to fulfill the international commitment but also seen as part of an initiative that will achieve the federal government's aspirations by 2030. Malaysia already started its pathway to sustainable development with a commitment toward international recognition and now Kedah will also

* Corresponding author: hasrul@kuips.edu.my

to be part of the wide landscape by providing sustainable development over food security. To date, the commitment can be described through effort in achieving SDG 1 and SDG 2, which statistical data shows that absolute poverty reduced from 49.3% (1970) to 0.6% (2014) with no reported cases of hunger [1]. Following all the efforts undertaken by the federal government, Kedah believes that these efforts can be further improved by concentrating on food security to ensure continued needs, not only at the domestic level, but also for international demand [2].

The problem of food security, however, is not new and several efforts have been made by the government through various policies to ensure that the effect of enforcing these different agendas will ensure that the sustainability of different angles is properly taken into account. Therefore, Kedah keeps its full concentration on empowering the beef industry and emerging as a national prominent hub for cattle production and beef suppliers in Malaysia. The agro-food industry needs to focus on commodity development and activities with high value-added to contribute to increasing Gross National Income (GNI) [3]. Swiftlet nest manufacturing, cattle and goat husbandry, aquaculture, seaweed, ornamental fish, herbs and spices, premium fruits and vegetables, mushrooms, and floriculture were the first areas of focus. It is anticipated that high-value agriculture growth would enhance local and foreign investment, open up new economic possibilities, and generate jobs. Investing heavily in worthwhile agricultural endeavours may also boost agricultural businesses' revenue and make the most of their available resources [4].

2 Literature Review

Regarding the issue of food security, Malaysia is ranked 28 out of 113 countries in the Global Food Security Index, it's also among the lowest in expenditure for agricultural R&D [5] as stated in Table 1.0. According to a 2019 Bank Negara report, Malaysia produces around 75% of its own food supply but it doesn't mean the food supply is secured. For instance, [6] highlighted that Malaysia is food secure on a national level, but food insecure on a household level. Based on the below table, food security is defined into several factors which are the availability of food, including access, utilization, and stability.

Table 1. GFSI Annual Baseline 2019 [6]

Global rank	Country	Overall Score	Affordability	Availability	Quality & Safety
23rd	Italy	75.8	82.5	68.3	79.7
24th	Poland	75.6	81.1	69.3	79.5
=25th	Spain	75.5	82.3	65.9	84.7
=25th	Chile	75.5	80.5	71.3	74.7
27th	Kuwait	74.8	88.1	62.3	75.9
28th	Malaysia	73.8	81.7	67.7	70.6
29th	South Korea	73.6	75.8	71.2	74.9
30th	Saudi Arabia	73.5	86.3	61.8	73.5
31st	Greece	73.4	77.8	64.9	86.0
32nd	Czech Republic	73.1	82.6	66.3	68.1

To guarantee a supply of local food and to cut down on imported meat, Malaysia's livestock business, particularly that of ruminant animals, has enormous potential to grow (see Fig. 1 and Fig. 2). The lack of high-quality breeds, high food prices, high livestock costs, and a lack of skilled labor are some of the problems and difficulties this business has had to deal with as it has grown. The government wants the livestock sector to undergo a change that is more concentrated on the livestock firms, the quality of the livestock production, the growth of Good Animal Husbandry Practices (GAHP), and the formula

manufacture of high-quality animal feed at competitive costs. In addition, the research and development aspect in terms of animal disease control and system efficiency livestock will be emphasized. Data shows that non-ruminant industries including poultry/duck, pigs, and eggs that have already reached the level of high self-sufficiency will continue to be developed so that the competitiveness and sustainability of this industry can be improved.

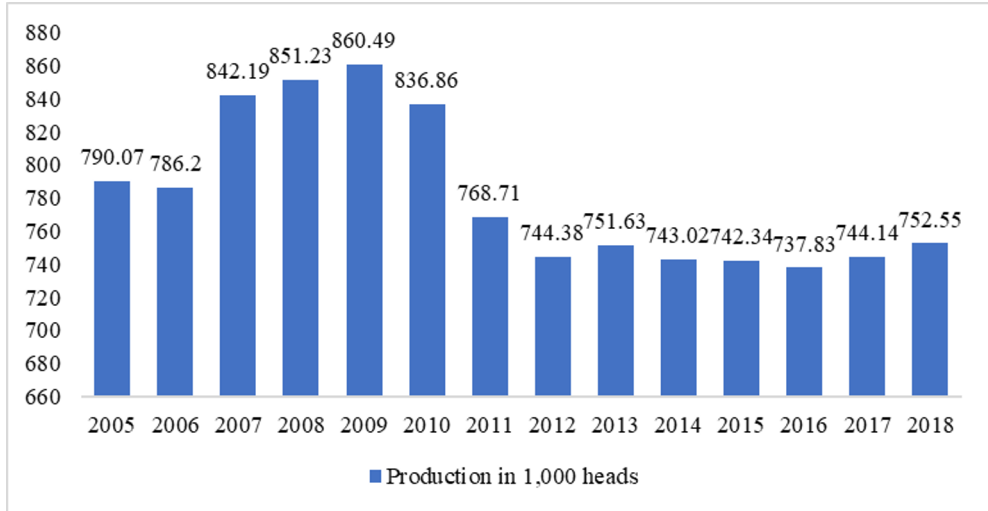


Fig. 1. Cattle Production in Malaysia from 2005-2018 [7]

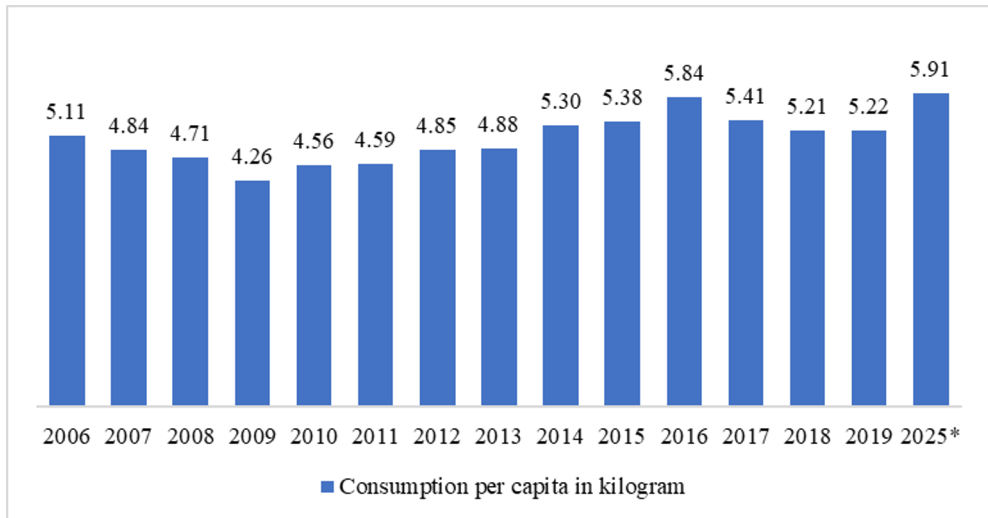


Fig. 2. Beef and Veal Consumption Per Capita In Malaysia 2006 – 2019 (with 2022) Forecast) [7]

The development of the ruminant livestock industry will focus on improving efficiency and being environmentally friendly. Thus, the following objectives are the future direction to be put into attention;

1. Transforming cattle breeding and quality in beef production based on economy of scale;
2. Increase the ruminant population productivity through breeding technology sharing and transfer using reproductive biotechnology and breeding techniques;

3. Conforming breeding innovation and the application for livestock comply with Sharia compliance, agreement, and halal integrity.

To fulfil the dietary requirements of livestock, beef cattle play a significant role as a producer of meat. Additionally, it aids the country in absorbing labor, particularly in rural regions. Due to the rate of population increase, the development of more sophisticated education, and growing knowledge of the necessity of ingesting nutrients from cattle, the national demand for meat is expanding along with the rate of economic growth that is improving. Overall, Malaysia consumes 4.8 kilos of beef annually, compared to 2.6 kilograms in Indonesia, 3.1 kilograms in the Philippines, and 9.9 kilograms in Vietnam [22]. In order to produce high-quality cattle quickly and in huge numbers while employing as many excellent males as feasible, artificial intelligence (AI) has been successful in enhancing the genetic quality of livestock. AI stands in stark contrast to embryo transfer, which has been shown to improve genetic quality and to stop or slow the development of illnesses brought on by interracial relationships [18]. AI can prevent the transmission of illnesses brought on by direct physical touch as well as the spread of other pathogens such as parasitic and harmful bacteria, viruses, and protozoa through contact [13]. AI is helpful for enhancing genetic quality, avoiding contagious illnesses, improving the accuracy of records, reducing expenditures, and minimizing accidents brought on by males. Malaysia, a resourceful nation, engages in a variety of agricultural pursuits, including the production of beef cattle. This activity is crucial as it contributes to the population of Malaysia's protein supply and emerges as the third contributor to the Gross Domestic Product (GDP) in 2017, after oil palm and other agricultural production [1]. The issue emerges when, however, ruminant output in Malaysia fails to reach the self-sufficiency level (SSL) as a result of issues with breeding stock, high feed costs, and ineffective production of beef, mutton, and milk [21].

Kedah takes special attention to the growth of the livestock industry and downstream, which consists of ruminant livestock, livestock feed, dairy livestock, agro-based industry, and various animal industries, in the allocation of the Kedah Budget 2020 proposed in 2019 [8]. This includes the development plan of a high protein 'home plot' grazing ground and the exploration of the potential of agricultural waste as livestock feed, to minimize reliance on the import of agricultural inputs. The allocation is RM2.25 million for the state veterinary development program also includes KLPK as a state industry player. This allocation also involves the growth of the grazing area of Bukit Kura as not only a pioneer in the cultivation of various commodities such as cereals, napier, and pineapple, but also in the cultivation of soft feedlots [9]. Therefore, the preliminary future direction of the industry must consider the seriousness of KLPK to develop innovation in breeding but also Sharia requirements to strengthen the business canvas.

3 Research Method

This study uses a method known as document analysis to evaluate current documents in printed and electronic form. This study's compilation of research results from many sources is focused on the distribution of the supply of cattle-beef products in Malaysia and the creation of value in the strategic plan. Reviewing the information that is already accessible, analyzing it fully, determining its applicability, and advancing scientific research are all phases of this process [10,11]. The data for this study comes from several publicly available sources, such as relevant journal articles, related books, newspapers, yearly reports, government broadcasts, scientific articles, official organization reports, and websites. The researchers use a rapid interview strategy [12] and provide extra information in addition to all sources that have been verified by experts and KLPK's senior management.

4 Findings

There are two models of artificial insemination, namely frozen semen and liquid semen. Both models have their own advantages and disadvantages with different levels of success [13]. The similarity of the use of frozen semen and liquid semen both must pass a macroscopic quality test first which includes, volume, color, PH, motility, consistency, and concentration, if they have a good value, they can proceed to the next process to be frozen or stored at room temperature 50C (liquid semen) which can be directly used [14].

The advantages of liquid semen are that it has high enough quality in terms of motility, viability, abnormality, and concentration. The results showed that the pregnancy rate with the use of cold/liquid semen was higher than with the use of frozen semen [13]. Another advantage of liquid semen technology is that it is an easy method and can be used directly for cattle marriages, both on an industrial scale and on smallholder farms, but has the disadvantage that it cannot be used for a long time and cannot be carried freely to various regions over long distances [14].

Artificial insemination generally uses frozen semen because of the advantages that it can be stored for a long time, is easy to carry anywhere without being hindered by distance and time, and with AI livestock can avoid venereal diseases from natural mating. However, in implementation in the field there are still some obstacles [15] explained that approximately 30% of spermatozoa die during freezing and spermatozoa survive during freezing, causing low fertility. In addition, the price of liquid nitrogen is quite expensive and is not always available in various regions.

Analysis of the success of AI is very important to see that the use of frozen semen or liquid semen is more effective and efficient in the occurrence of fertilization and pregnancy of female livestock. The variables observed to determine the success of AI are Non-Return Rate (NRR) and Conception Rate (CR) [16]. NRR is the absence of lust of cattle after mating between 2-3 months which is assumed to be pregnant [17]. CR is the percentage of pregnant cows in the first AI. The results of research conducted by [16] showed that AI using frozen semen was better than liquid semen with NRR values on observation days 21, 42 and 63 after AI was carried out on frozen semen 81.48%, 81.48 %, and 81.48%, in liquid semen 81.48%, 81.48%, and 70.37%, with the CR value of frozen semen being 62.96% higher than that of liquid semen AI which was only 51.85 %. The percentage value of CR is influenced by many things, including the quality of the semen used. The success of AI will be seen in CR (pregnancy) showing timely AI implementation and estrus detection.

The research on the success of AI with frozen semen carried out in Polewali Mandar regency, West Sulawesi Province, namely in Wonomulyo and Tinambung districts also showed a Conception Rate (CR) of 78% and a Service Per Conception (S/C) of 1.5 which was a very high value for AI services good, a good S/C value is 1.6-2.0 while other factors that influence the success of AI are the type of parent 85%, Body Scoring Condition (BSC) 83%, AI implementation time includes 82% estrus, inseminator skills 81 %, and skills of farmers in detecting estrus 80% [18]. The results of a similar study conducted by [19] showed the success rate of AI in East Halmahera in three villages, namely Bumirestu, Dakaino, and Akedaga villages with S/C, CR and CvR values as follows (1.08; 92.5%; 87%), (3.33; 71%; 25%) and (5.71; 70%; 10%). Various research results show that the use of frozen semen as an AI model is widely used because of its advantages that it is easy to carry anywhere and still has good quality during insemination [19].

5 Discussion

The Islamic Sharia was revealed by Allah SWT to provide goodness to mankind through the messenger of the Prophet SAW as his words: Islam is a religion that includes all aspects

of life. The importance of the world and the hereafter is always a measure for people to achieve true happiness and well-being in life. In general, human consumption, especially food, is emphasized in Islam, as is the case with Genetic Modification Organisms (GMOs). It must be through a procedure based on the stipulations of Islamic law and research through the balance of Ijma' and Qiyas by Islamic scholars. Allah SWT tells people to choose food that is halal and good. This is recorded in the Qur'an as the words of Allah SWT mean.

"O humanity! Eat from what is lawful and good on the earth and do not follow Satan's footsteps. He is truly your sworn enemy." (Al-Baqarah: 168)

Based on the arguments above, Islam establishes two criteria for the consumption of food, which are halal and good (*Halalan Tayyiba*). The basic principles of *Halalan Tayyiba* show that Islam is firm in its stance on matters that may pose a risk to consumers such as cleanliness, safety, and quality [20,21]. In the framework of the artificial insemination process, as long as its implementation does not conflict with Islamic prohibitions, then it is allowed [22]. But in the determination of the law, Allah SWT forbids his people to take things lightly as His words in the Qur'an.

"Do not falsely declare with your tongues, "This is lawful, and that is unlawful," (only) fabricating lies against Allah. Indeed, those who fabricate lies against Allah will never succeed." (Al-Nahl; 116)

From the point of view of Sharia, the legal debate for artificial insemination is linked to the aspect of *maslahah*. Scholars define it as an effort to benefit and reject all harm [23]. According to [24], something that aims to achieve *maslahah* must not contradict the sources of Islamic law, namely al-Quran and al-Sunnah, Ijma' Qiyas and *Maqasid* Syariah. After examining the parameters set by Islamic law and the views of scholars in this regard, the breeding process developed is aligned with the following three categories.

The findings shown in the study are also consistent with the benefits in animals such as healthy growth, meat and milk production, prevention of sexually transmitted diseases, and better breeding [25]. Here it shows that if the research approach is integrated in the context of *Maqasid* Syariah, it greatly benefits the development and stability of the ummah through the concept of al-Falah in *Maqasid* Syariah including the success of the world and the hereafter as stated by [26]. The high demand in the market leads to the need to produce a quality product that gives profit that needs to be considered as long as it does not conflict with Shariah law and through a process based on the concept of halal *toyayiba* [27, 28]. Here it shows that as long as the production of quality cattle is based on the parameters of *Maqasid* Syariah, it not only has a high marketability value, but it also provides benefits to humans, nature, and the development of the industry and the economic sector of Muslims [28].

6 Conclusion

Conceptually, frozen and liquid semen are the two types available for artificial insemination. Each has advantages and disadvantages. Before further processing, both call for a careful quality evaluation. Islamic Sharia, which was revealed for the benefit of humanity, places an emphasis on material and spiritual matters, including issues with food like GMOs. *Maslahah*, which is in line with the teachings of the Quran, the Sunnah, the Ijma, the Qiyas, and *Maqasid* Syariah, is the key to sharia compliance in artificial insemination. The benefits of healthy animal development, higher meat and milk production, illness avoidance, and better birth outcomes are all highlighted in the research. Research that is in line with *Maqasid* Syariah supports the development of the ummah by

bridging material prosperity and spiritual concord. Production of lucrative, Sharia-compliant, and *halalan toyyiba*-based cattle is required due to the high market demand; this is advantageous for people, the environment, and the Muslim economy.

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