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The Future of the Malaysian Beef Industry

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Abstract

Beef is an important protein food source, and an important commodity for a country like Malaysia. Countries such as South Korea and Japan have not only been able to increase beef output, but have also introduced their breed, the Hanwoo and Wagyu cattle respectively into the international beef industry. Meanwhile for Malaysia, it was expected that local production can only fulfill 30% of the country's total beef demand for 2012. Although research in enhancing cattle production started concurrently with countries such as South Korea, the 40 years of research put into enhancing the local production of cattle species for their beef has been futile. Drastic measures need to be taken to ensure the country's self-sufficiency in the cattle industry, and identifying the causes leading to the declination should be the main priority to prevent further deterioration of the industry.

1. Introduction

The Malaysian government aims to be 40% self-sustainable in beef by 2015. Currently the local beef production can only fulfill 30% demand, with time flying by, the question arises on the ability of Malaysia to produce the extra 10% by 2015 to reach the target set by the government.

International trade in beef is big business; with countries such as New Zealand, Australia, Brazil and India the major global suppliers (Malau-Aduli & Holman, 2014). For example, New Zealand produces only 1% of the global beef production, but equates to 8% of total global beef trade, capturing niche markets that demands high quality product (Bell, et. al., 2011). On the other hand, India has been aggressive in producing beef from water buffalo for the international market as a much cheaper alternative (Malau-Aduli & Holman, 2014). The issue of food security led to countries engaging in food production for their respective local consumption. With increasing population, Malaysia is also in need to fulfill the local consumers demand. Apart from the production of staple food, the change in people's diet (Rolle, 2013) and the need to be self-sufficient has led to a boom in meat associated industry. As an example, Malaysia has been able to fulfill to a large percentage the local consumers demand for poultry since the 1970s, but has yet to produce similar outcomes for beef.

Animals in Malaysia produce 2025,000 metric tonnes of food in 2010 sharing 27% of the total domestic food production. Table 1 highlights the quantity and value of major products obtained from some livestock in Malaysia.

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Table 1: Production quantity, Ex-farm value and consumption of major livestock products, 2011 in Malaysia

	Production (000MT)		Ex-farm value (RM million)		Consumption (000 MT)	
Product	2010	2012*	2010	2012*	2010	2012*
Beef	46.51	51.28	847.11	929.17	154.40	173.82
Chevon/Mutton	2.39	3.16	67.66	83.08	19.67	24.52
Poultry (live)	1,295.60	1,374.50	5,776.21	6,866.31	1,227.45	1,348.63
Pigs	234.00	233.00	2,073.62	2,047.04	2,453.90	2,484.09
Eggs (Mil. units)	590.00	643.00	2,358.62	3,143.39	8,572.00	9,354.00
Milk (Mil. L)	67.00	75.00	127.29	150.00	789.23	807.99

Source: DVS, 2011, *estimated

Share of poultry meat, eggs, pork, beef, milk and mutton/chevon in total ex-farm value of livestock products (RM 10,870 million) in 2010 respectively were 53.1%, 22.1%, 15.5%, 7.5%, 1.2% and 0.6% (DVS, 2011). Of the different meat producing species, goat and cattle population show an increasing trend over the last decade but the population of sheep and buffalo population are shrinking.

Although there was over 900 thousands cattle documented in Malaysia which was much higher than other potential red meat producers such as buffalo, goats and sheep (Table 2), yet the country's beef self-sufficiency was expected to attain 30% for 2012. Table 3 meanwhile reflects the self-sufficiency level achieved in recent years from different subsectors of the livestock industry.

Table 2: Statistical records of cattle, buffalo, goat and sheep recorded for 2011 in Malaysia

Species	Heads of animals	No. of owners	No. of animal/farm	No of animal/100 human
Cattle	909,807	43,310	21.01	3.369
Buffalo	130,093	3,925	33.14	0.520
Goat	537,667	20,602	26.10	2.151
Sheep	128,066	3,963	32.32	0.512

Source: DVS, 2011

Table 3: Malaysia self-sufficiency achieved (%) for beef, chevon/mutton, milk, poultry and eggs in recent from 2006 to 2012

Product	2006	2009	2010	2012*
Beef	21.78	28.22	30.12	29.50
Chevon/Mutton	8.99	11.20	12.13	12.87
Milk	4.66	8.79	8.49	9.28
Poultry meat	107.74	104.72	105.55	101.92
Egg	109.06	117.53	114.63	114.49

Source: DVS, 2011. *estimated

Table 3 reveals the national poultry sector has grown tremendously but the figures of self-sufficiency for beef, mutton/chevon and milk are discouraging. It was reported that domestic beef production grew at an average of 9.03% per annum from 2003 to 2010 (Table 4), was predicted to slow down in 2011 by 4.76%. Growth production for beef was expected to maintain at 4.76% from 2011 to 2012. On the other hand, although beef consumption grew at an average of 2.2% annually from 2003 to 2010, the

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increase in beef consumption for 2012 compared to 2011 is expected to increase by 6427 metric tonne, which is more than 2.5 times the expected ability to produce beef for the same period of time. Current production of beef is incapable of keeping up with increasing demand. Meanwhile, the mutton/chevon production from sheep and goat meanwhile is growing steadily at 8.25% annually from 2003 to 2010, is predicted to grow by 13.04% in 2011. Even though the expected growth in mutton/chevon production is expected further increase by 13.04% from 2011 to 2012, yet still the increase in production from 2011 to 2012 is 2.76 times smaller than the expected production increase for the same period of time. Similarly to beef, the current production of mutton/chevon is incapable of keeping up with increasing demand.

Table 4: The yearly percentage (%) rate of production and consumption for beef, mutton/chevon and milk from 2004 to 2012

	Production rate (%)			Consumption rate (%)		
Year	Beef	Mutton/ chevon	Milk	Beef	Mutton/ chevon	Milk
2004	10.10	1.36	5.65	12.72	16.58	2.45
2005	9.31	9.59	5.67	-6.88	11.20	-44.81
2006	7.81	8.75	9.57	5.05	4.65	7.97
2007	8.84	10.11	11.00	-1.13	-1.72	-9.76
2008	8.56	9.11	9.59	-6.79	7.97	-36.60
2009	9.31	9.41	9.33	9.20	1.54	8.18
2010	9.31	9.41	7.01	3.33	1.83	10.19
[p]2011	4.76	13.04	5.46	7.76	15.90	-46.65
*2012	4.76	13.04	5.51	3.70	4.63	33.39

Source: DVS, 2011, [p]predicted, *estimated

Milk production growth increased at an average of 8.26% from 2003 to 2010 and is expected to decrease slightly in 2012. The national milk self-sufficiency increased by almost 2 times from 4.66% in 2006 to 9.28% in 2012. Like beef and mutton/chevon, milk production is still unable to satisfy the annual increase in milk consumption of the country.

Even though Malaysian population increased by 1.59% from 2010 to 2011, but the percentage rate is decreasing by an average of 0.07% annually since the year 2000. Yet still the annual county population increases by 0.45 to 0.55 billion since the year 2000. Although initiative to systematically increase production of cattle, sheep and goats for the local consumption began since the 1960s, little has been achieved so far in ensuring the food security of the country.

2. Beef production in Malaysia

Bovine production in Malaysia is commonly bred for its meat rather than its dairy produce whereby the later occupies only 5% of the total cattle population in the country (Boonyanuwat, et al. 2013). Due to consumer's preference for fresh produce, carcasses are normally hot-boned and sold within the next 24 hour normally at roadside butchers. Once frozen, beef is normally perceived as having a much lower quality and fetches lower price.

The Kedah-Kelantan (KK) cattle is a local indigenous breed in Malaysia, and its population accounts to almost 85% of the total cattle population of the country (Johari & Yasmi, 2009). The KK cattle are small in size, can adapt well to the local environment, and are highly tolerant to ticks and parasites (Johari & Yasmi, 2009). Furthermore, KK

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cattle have high fertility and calving rate, and low weight gain. Because of these traits, the KK cattle are highly popular among cattle small holders, but not commercial farmers who would prefer high weight gained animals.

Various exotic species has been imported since the 1970s to increase the local bovine production. Among the cattle breed imported into the country were Brahman, Hereford, Aberdeen Angus, Droughtmaster, Santa Gertrudis, Bali, Shorthorn and the Chinese Yellow Cattle (CYC). For example, the Draughmaster were imported in large numbers by the DVS in the 1970's, and distributed among small holders and commercial farm. After almost 4 decades, the Draughtmaster had little impact on the local bovine industry. The Brahman meanwhile can adapt well to the local environment, but information on its efficiency as commercially viable beef producing breed in Malaysia is limited (Johari & Jasmi, 2009). The cross breeding of local KK cattle with imported exotic breed led to better growth rate beef cattle, but having relatively poor reproduction performance (Abdullah, 1993).

Cross breeding of animals has been conducted in Malaysia for decades. Being the most prominent breeding cattle in Malaysia, the KK cattle have been used as a base population for crossbreeding with exotic breeds. Several successful cross breed conducted in Malaysia indicated encouraging crossbreed performance (Flint, 1971; Pathmasingam and Sivarajasingam, 1978; Dahlan, 1985; Ariff et al. 1986). Examples of crossbreed with great commercial potential were the Brakmas and Charoke Cattle. The Brakmas was declared a stable synthetic breed with 50% Brahman and 50% KK 1999. The Charoke cattle meanwhile were also declared as having 50% Charolis and 50% KK. Although both these breeds has shown a much exceptional beef production rate than pure KK cattle, yet no systematic commercial breeding of superior crossbreed for the purpose of increasing local cattle production has been made public. These crossbreeds are better beef producers, but there are reports of problems arising during parturition (Abdullah, 1993) may have been one the reason systematic breeding of the cattle were not materialized.

In the last decade, mass production of cattle for beef was evaluated. The initial successes with CYC palm oil integration by the Malaysian Palm Oil Board (MPOB) lead to further import of over 800 CYC in 2003 were introduced into Ladang Sungai Gayung and Ladang Sungai Marung in the state of Pahang. The calving success was reported to be higher than 74% (Tohiran et al., 2008). In a recent report by Tohiran et al. (2012), in palm oil plantation and cattle feedlot system, calving success was 85%, but the breed used was not explained. No detail study was available on the future potential of this approach was ever put forward.

3. Pure breeding success

Selective breeding was first reported in the 18th century, whereby 2 good breed is mated to produce a better offspring. The purebred activities of beef cattle for several generations managed to develop better quality beef cattle. Although pure breeding activities has been conducted systematically in Europe and the United States of America, the success of South Korea was considered exceptional since it turnaround the whole beef industry for the country. The success of South Korea to improve the beef output of its local Hanwoo cattle has now shifted from beef production to increasing beef quality. The purebred breeding of Hanwoo which was initiated in the 1970s managed to increase the weight of 18 month old cows from 245.9 kg in 1974 to 308.7 kg and 18 month old bulls from 289.6 kg in 1974 to 477.2 kg in 1992 (Song, 1994). Today, the live weight of Hanwoon cattle can reach over 600 kg when ready for market (Zhou & Prideaux, 2009) further highlights the potential of breeding pure bred animal for cattle production. Similar success has also been reported for the Wagyu cattle of Japan (Kahi & Hirooka, 2005). Pure bred cattle breeding system can be found all over the world, all showing great success in cattle production.

The KK cattle have great potential to undergo similar pure bred breeding program to improve cattle production. The setup of two nucleus herd in Tanah Merah, Kelantan and at the Mardi Station in Kluang was initiated by DVS after the first meeting of the committee for the development of

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policy and systems of breeding cattle in 1980 (Johari & Yasmi, 2009). The nucleus farm for the purebred KK in Kluang has long stopped operation. Meanwhile, the breeding program in the DVS Tanah Merah Nucleus Farm has not been able to properly compile systematic data on the available stock on the farm may explain why no consistent improvement in the growth performance of the KK cattle has been evaluated (Hafiz et al, 2009). A recent report by Raymond and Abu Hasssan (2012) is an indication that the KK breeding program is still on-going but the rate of success is not known.

Over the last few decades, many research and development activities to improve national beef production have been conducted. Information and evaluation on the successes till today has not been properly documented. Follow-up on the successes show minimal documentation to declare a proper strategy for large scale production. Inability to manage data for reporting has led to indecisive conclusion on which approach is the best to be applied to increase animal numbers. What started off was 2 nucleus farm, one closed down years ago, and another may follow suit soon if no initiative to revive the program using better data collection and management strategy.

4. Other strategies for improvement of beef production

Implementation of strategies in the science of breeding was not properly managed. Although the expectation was similar which is to increase beef production, the approach taken was disorganized. A proper scientific approach should be applied which should cover at least 4 clusters of activities needed for livestock development. These are (i) Breeding and improvement (ii) Nutrition and feeding practices (iii) Prevention and control of diseases (iv) Promotion and incentives. These should be done in order to maximize the expected outcome.

Breeding of animals does not necessarily mean just arrangement of mating but it should aim to increase the quantity and quality of each animal. All genotypes do not necessarily perform well or perform badly in the same environment. Gradual genetic improvement programmes and breed/type evaluation studies needs to be undertaken. Efficient breeding methods such as the use of AI should help to improve better cross breed progeny, as well as a method to introduce batch breeding which is currently applied in highly develop ruminant breeding and production programmes outside Malaysia. What use is a systematic breeding program such as with AI if there is limited supply of good genotypes among the breeders in Malaysia. Such step to increase the number of purebred or cross bred animal with good genotype is necessary to mitigate the low availability of breed stock. Although Malaysia initiative to improve the cattle industry began almost 40 years ago, the disappointing outcome seen today show the lack of focus to improve the industry. The focus on cross breeding of cattle for beef have now shifted to improve indigenous species have been futile, since the effort put in are still unable to translate into success similar to the Hanwoo cattle industry. Years of research put in breeding improvement has also not shown any large scale commercialisation initiative. Livestock breeding network is very weak in Malaysia. Inadequate number of breedable cows greatly impedes the growth of the bovine industry in Malaysia. This is true both for dairy and beef cattle. Enhancement of herd level reproductive efficiency in cows and prevention of fertile cows from slaughtering may contribute magnificently in the augmentation of their number in the population.

Nutrition and feeding practices in Malaysia primarily focuses on fattening of animals for slaughter, and utilising agriculture waste product as feed. Very little work has been done to evaluate the commercial value of feeding practices in large scale farming. Feedlot animal fattening system has shown to be very effective in preparing animal for slaughter, but the low number of animal stock in the country has not been able to keep up with the demand for calf/kid. Although Malaysia is gifted with large land area, it does not possess large pasture area to graze livestock. Most of the develop agriculture lands are for either palm oil or rubber. Palm oil plantation in Malaysia covers close to 5 million acres of land, and integrated cattle grazing in palm oil plantation was calculated to be profitable (Tohiran et al., 2008). The palm oil cattle integrative system can be an alternative to field

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pasture for grazing. The only difficulty in palm oil integrated grazing breeding approach is to make it systematic, and the ability to manage data collection. Systematic livestock management in integrated palm oil farm by localising the movement of cattle into groups can help to easily manage cattle production.

The successful livestock industry in New Zealand has been attributed to its biosecurity law preventing the importation of live animal and their meat product. This was a method to prevent the importation of disease. Because New Zealand has no land border with any other country, the prevention of importation of animal disease was possible. Although the Malaysian Government through DVS controls importation of animals, unreported border trade especially in the states bordering Thailand do frequently occur. A strong livestock industry is needed as it would play a better role in educating the community on biosecurity issues which can harm the local industry. Furthermore, farmers should be encouraged to use the service of veterinarian, so outbreak of disease can be monitored, contained and remedied.

More encouragement and incentives should be given to farmers to develop the meat industry, namely for cattle and goats. The projected increase in ruminant production requires the economic and political will to minimize importation of livestock products such as meat and milk to catalyze the national ruminant industry. The government should encourage small holders to have co-operative ventures pooling livestock together. Not only will this enhance production, such approach can ease data collection to properly evaluate the effectiveness of the various breeding system used in the industry.

5. Conclusion

The production of beef to increase independence from imports has been on-going for decades but so little has been gained from the investment poured in research and field study. Should the government continue to invest in research to increase beef production, knowingly past results show no systematic improvement. Genetic improvement is a slow process, and requires dedication and perseverance. A national initiative should look into the potential of pure breeding programmes tailor made to increase local breed numbers and quality.

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