

---

---

# Monitoring Livestock Productivity in Malaysia

Z.A. Jalan<sup>1</sup> & M.M. Dahan<sup>2</sup>

<sup>1</sup>Department of Animal Science,  
Faculty of Veterinary Medicine and Animal Science,  
University Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia  
<sup>2</sup>Universiti College UPM Trengganu, Trengganu, Malaysia

---

In many developing countries, a large segment of the population is engaged in several agricultural activities including animal farming. However, in Malaysia, the number of people in animal farming is dwindling for three main reasons. Firstly, rapid urbanisation causes migration of farm workers into the cities seeking better opportunities. This leads to difficulty in getting human resources to manage farms. Secondly, urbanisation also means that land available for cultivation and farming will be very much reduced. It will continue to decline as more buildings and factories are erected. Finally, animal farming particularly ruminant production, has been shown to be labour intensive and does not produce comparable monetary return as compared to other non-agricultural activities. As such ruminant farming tend to become a sunset industry as compared to the successful pig and poultry enterprises.

By and large, the Asian animal agriculture is also characterised by the preponderance of small farms and traditional crop-animal systems (Devendra, 1994). Increasing the productivity, particularly of the ruminant sector is a big challenge which include minimising the cost of feeding by utilising natural resources and application of technological options in livestock production.

This paper briefly highlights the livestock industry and its significance to the Malaysian economy. Particular emphasis is placed on the development of the ruminant sector. This paper also discusses the management input with respect to farm recording and its use in the development of the livestock and poultry industry in Malaysia.

This industry is an important component of the agricultural sector in Malaysia. Its share of the Gross Domestic Products is approximately \$US 1.5 Billion. It contributed to 25 and 44% of the 1995 national agricultural and food production, respectively. Animal farming activities are largely centred in Peninsular Malaysia.

---

---

## 1. Introduction

---

---

---

---

## 2. Livestock industry in Malaysia

---

---

Poultry and pig industries are the most developed and important sectors and has contributed to approximately 94% of the total livestock output in 1995. Pork and poultry products are produced in excess and Malaysia exports these products. The ruminant sectors are struggling to improve their production capacities even though their population are much lower than the swine or poultry. Most significantly are the persistent reduction in their population over the years (Table 1).

Even though the output of most livestock products increased gradually over the years (Table 2), the demand particularly for beef and dairy products exceeds their supplies as consumption increased (Table 3).

### **3. Beef and dairy production in Malaysia**

Farming system in Malaysia is generally a smallholder type which is characterised by a low input and output. The cattle population has to treble and their productivity improved through cross-breeding. In a series of the National Development Plans from 1971 to 1990, Malaysia embarked on a massive import of breeding cattle to increase the base population with the objective to achieve self sufficiency or near self sufficiency in beef and dairy products by 1990. This objective was never achieved as evidenced by the consumption rate greater than the production capacity of the local farms (Table 3).

Beef production will be promoted in the integrated sustainable production system with the plantation crops, largely in oil palm plantations and to a lesser extent in the rubber plantation (Harun & Chen 1995). The environmental conditions in the plantations are conducive to beef cattle production as have been demonstrated for sheep (Rosli and Nasir 1997). The potential of this system has been shown in sheep and the approach is convincing as Malaysia has enormous acreage of oil palm plantations. The integration of beef cattle with the oil palm plantation has been adopted in several oil palm plantations, particularly in the southern part of Malaysia.

The dairy industry is mostly a part time activity with only a few large (more than 100 heads) commercial operations. Although traditionally, consumption of dairy products in Malaysia has been relatively low, there is no doubt that a rise in disposable income has altered lifestyles and dietary habits accordingly, and will continue to do so. However, the production of raw milk in Malaysia is still a small contributor to the country's overall milk requirement. At present, the raw milk production is approximately 5% of the national consumption. The local milk production will be further consolidated towards the creation of more commercial dairy enterprises to supply the local fresh milk market.

Feeding systems are generally based on agricultural by-products which are produced in large amount (Table 4). The strategy to use agro-byproducts would be enhanced by intensive research programmes.

The most popular local source is the oil palm by-products particularly the palm kernel cake, which forms the major energy and protein sources for the dairy and fattening cattle in feedlots. Some of these by-products such as brewer's grain, wheat bran and pollard and soybean meal are produced from the processing of imported resources.

Many countries in the tropics are increasingly importing European breeds of ruminants in their attempts to increase milk and meat production. Malaysia also embarked on an importation programme of several cattle breeds for the purpose of increasing milk production and finding the suitable breeds that can adapt to the environment. In the late 1970's and early 1980's, the dairy breeds imported were Holstein-Friesian, Australian Milking Zebu, Brown Swiss, Ayreshire, Jersey and Shorthorn (Murugaiyah 1982). Later, the Friesian-Sahiwal (50-50) breeds were imported from mostly Australia and New Zealand in an attempt to improved the local milk

#### 4. Development of the dairy and beef industries

*Table 1. Livestock population in Malaysia.*

Year	Buffaloes	Cattle	Goats	Sheep	Swine
1986	141 938	559 582	258 101	90 359	1 591 529
1990	129 517	614 498	281 759	199 909	2 242 055
1993	110 149	689 288	277 065	244 023	2 334 744
1995	103 027	659 065	228 589	203 624	2 491 139

Source: Dept of Veterinary Services Malaysia (1995)

*Table 2. Livestock production in Peninsular Malaysia.*

Year	Beef (MT)	Mutton (MT)	Pork (MT)	Poultry meat (‘000)	Milk (million L)
1986	12 308	586	141 350	248.8	24.1
1990	12 244	658	197 301	348.5	26.2
1993	13 663	607	231 140	560.7	29.23
1995	15 395	530	246 623	631.4	31.87

Source: Dept of Veterinary Services Malaysia (1995)

Table 3. Production and consumption of beef, milk &amp; milk products.

	Beef			Milk		
	Production (MT)	Consumption (MT)	Per Capita (kg/year)	Production (million L)	Consumption (million L)	Per capita (L/year)
1991	14 347	63 796	3.38	30.0	837.23	44.4
1992	14 833	65 408	3.38	31.2	801.15	41.42
1993	15 623	70 052	3.53	33.1	738.08	37.18
1994	15 188	77 647	3.81	35.5	545.05	26.78
1995	16 919	85 985	4.12	36.8	875.52	41.70

Source: Dept of Veterinary Services Malaysia (1995)

production. The production data were not conclusive and as such the suitability of the dairy breed could not be recommended to improved the dairy cattle production programme.

It appears that a correct collection of production management data is essential before a judgement is made on the genetic potential of a breed of animal. Some records indicated that the reproductive performance of these herds varied enormously between and within herds, which is largely attributed to environmental stress such as high humidity. The reproductive efficiency of pure bred *Bos taurus* breeds and their crosses with more than 50% *Bos taurus* tend to decline. These cows also exhibited long calving interval and poor conception rates. Today, we are still seeking the appropriate beef and dairy cattle breeds. It may appear that the genetic potentials of the cattle were limited by low management input and environmental stress.

In modern dairy farming, successful management relies on good record keeping and on information that can be derived from it. With the records, the farm management plays a central role in the management decisions through the interpretation of the recorded information. Farm records are to be utilised routinely for daily management and to solve problems. A quantitative knowledge about a farm provides the basis for understanding where the dairy has been, where it is today and where it is going.

Maintenance of animal data is generally carried out by the Department of Veterinary Services. The most established data are those related to the health and disease control programmes. Report of the livestock production statistics is also produced annually. University Putra Malaysia, Malaysian Agricultural Research Development Institute and farms under the Department of Veterinary Services organise their individual recording system related to animal productivity including the reproductive performances. This is not normally organised at the smallholder system and thus a national standard values are not precisely known.

By and large, farmers are ignorant of the importance of maintaining farm data. They are not trained to record and maintain farm data. In addition, farming is generally engaged as a part-time activity, time is a major constraint. Data may be only in the memory of the farmer or scattered in many different spots. For example, a disease outbreak is noticed, but no data on disease incidence or performance have been recorded. Without a correct assessment of the magnitude of the problem, quantitative improvement of heifer health, growth and economics, after intervening actions, cannot be shown to the farmer. However, our main concern has been related to the unavailability of proper breeding data at most farms.

---

---

## **5. Animal recording and organisational structure**

---

---

---

---

## **6. Animal recording at smallholder system**

---

---

The first step is to train farmer in accurate and complete record keeping. The data must be recorded in a functional way. Some of the important data that the farmers should keep are:

1. Individual animal records of reproductive events, health disorders, condition scores, culling, laboratory reports.
2. Herd events e.g. vaccinations, ectoparasite control, anthelmintic treatment.
3. Breeding records.

## **7. Record keeping and data storage**

Keeping farm data requires skill and organisation so that they can be retrieved easily and used to make sound interpretations and decisions. Manual recording are normally practised. An electronic record keeping system in milk production is not used, even though milking parlour in large farms are automated. The main reason being that the animal numbers may be small and the productivity is low to justify expensive installation of a computerised system.

However, the automatic cow identification systems have been used in an extensive beef cattle farm. The system has greatly assisted animal counting, weighing and monitoring growth.

## **8. The record of reproductive efficiency of dairy cows**

Reproductive efficiency of the dairy cows is considered as the most important information used to compare the suitability of dairy cattle breeds in Malaysia. These data are normally maintained and used in all institutional farms such as those owed by the Malaysian Veterinary Services and the University Putra Malaysia. The records were used as the basis of selecting breeds of temperate dairy cattle to be imported during the expansion of the dairy cattle industry in Malaysia. The reproductive efficiency records are still maintained at most institutional farms and have been used effectively for several purposes. However, it is undeniable that, some of these records have not been regularly updated resulting in some relevant records being missed. Future plan and recommendation on suitability of breeds in our environment are made difficult by unavailability of these records.

The most common records of the reproductive performance are: length of oestrous cycles, calving intervals, service per conception, calving to first oestrus and service period (calving to conception). In a report, the Holstein-Friesian cattle in Malaysia, the calving interval was 496 days, services per conception was 3-6 and age at first calving was 36 months. In the imported Jersey, the interval between the first calving to first oestrus was 68 days. These parameters have been used to compare the suitability of several breeds of dairy cattle in several stations in Malaysia.

*Table 4. Local feed production in 1996.*

Feed type	Estimated production (MT)
Copra cake	12 000
Rice bran & polishing	50 000
Cassava residue	30 000
Palm kernel cake	1 000 000
Molasses	50 000
Brewers grain	4 0000
Soybean meal	450 000
Wheat bran & pollard	45 000
Fish meal	45 000

Calving to conception interval is one of the major factors affecting the economics of dairying. A cow should be bred and it should conceive within 60-90 days post-partum. In the imported Jersey, the mean days open for the second reproductive period was 288 days with a range of 84-429 days. Most of the cows were repeat breeders and longer intraoestrous period contributed to this extended calving to conception interval.

These records have been cited on many occasions when recommending the purchase of dairy herd either by private enterprise or institution. The pure-bred Jerseys and Friesian, either pure or 50-50 are considered an undesirable breeds in Malaysia with respect to milk production and reproductive efficiency. However, today, farmers are now keen on rearing pure-bred Friesian or Jerseys or Friesian-Sahiwal (75-25) which is contrary to the earlier recommendation. Perhaps, there are isolated cases of successful production system using these breeds and that the farms records from which recommendation were extracted, was not properly managed.

Suitability of breeds was also based on the health records that was maintained in most farms. In the study of Jersey cattle (Murugaiyah 1982), causes of death, number of abortions, dystocia, neonatal and prenatal death were all recorded and compared with those reported for Holstein-Friesian which were also imported at about the same time as the importation of the Jersey.

---

## 9. Health records

---

---

---

## **10. Manual recording of data**

---

---

Manual data recording and storage has been the main mode of record keeping in most farms particularly in smallholder farms where the average number of animals is 12. Computation of the primary performance indices is uncommon and is only carried out when farm research is conducted by a researcher. Farmers do not usually use recorded data as a tool to management of his animals or farms. Perhaps most farmers are ignorant of the importance of the recorded data in farm management.

Electronic data processing is far more efficient than manual, but many performance figures can be manually computed. Hand calculations take time and herd dependent, and may be impractical for large herds. As there is no accessibility of data in centralised systems, such as Dairy Herd Improvement databases, the use of computers in herd health and herd management services are not practised in Malaysia. This is perhaps far different in North America (Nelson, 1994). The availability of the right data is the key factor in the herd health and management programme. In countries where livestock production is successful, most farm data are routinely computed into performance indices which are used to monitor animal performances.

Manual data processing is, in a large number of farms, the only way to generate adequate information in the form of performance indices that can be used for making decision (Kristula and Uhlinger, 1995). Not all primary performance indices, such as calving interval, age at first calving, etc., are easily calculated manually. This approach lacks flexibility and computational ease as compared to computerised systems. Monthly monitoring is not a regular exercise and is not consistently recorded. Thus, a pattern or trend of a particular record could not be translated effectively.

---

---

## **11. Computer aided technology in animal data recording**

---

---

The rapid progress of the livestock farming technology today has created a need to devise a method to develop and transfer technology efficiently. One example is the Trop-Dairy. Feed software developed by a research institution to assess cost-benefit ratio and to estimate performance and feed requirement of lactating and dry dairy from a given feed quality. Other software regarding investment analysis, breeding plans, pasture and fodder management, environment modifications and other livestock technologies have been planned.

---

---

## **12. Future of animal recording**

---

---

The advancement of information technology should make animal recording an easier and essential exercise. All data could be utilised effectively and assessable from any parts of the country. There is a need to establish a unit dedicated to keeping and organising all animal records. The unit must be staffed with efficient and responsible person and using computer as a management tool.

The cost of acquiring relevant technology and updating of data could be constrained by lack of funds. However, the information system is an important source of information for a successful livestock farm operation. Most important is to determine the correct data to be collected before they could be used effectively in a herd management programme.

**Dept of Veterinary Services Malaysia.** 1995. Livestock statistics 1995. Dept of Veterinary Services, Ministry of Agriculture Malaysia.

**Devendra, C.** 1994. Animal Production systems in South East Asia: Potential and challenges. Proc. Int. Congress on Quality Veterinary Services For the Twenty first Century. 15-17 November 1994, K. Lumpur, Malaysia, 4-13.

**Harun, O. & Chen, C.C.** 1995. Better return from an integrated beef-oil palm enterprise. Proc. 17<sup>th</sup>. Malaysian Soc. Animal Prod. Conf., 30-40.

**Kristula, M. & Uhlinger, C.** 1995. Dairy herd-health monitoring - Hand-written records to monitor disease events. The Comp. Cont. Educ. 17: 1520-1525.

**Murugaiyah, M.** 1982. Reproductive performances of imported Jersey cows in Malaysia. MSc Thesis, Universiti Putra Malaysia.

**Nelson, A.J.** 1994. Information needs of the dairy industry for health and nutrition management. J. Dairy Sci. 77: 1984-1991.

**Rosli, A. and Mokh Nasir, W.I.** 1997. Environmental imteractions on livestock integration production systems in plantations. Proc. 19<sup>th</sup>. Malaysian Soc. Animal Prod. Conf., 7-12.

---

---

## **13. References**

---

---