

## 4. STATUS AND PROBLEMS OF ANIMAL PRODUCTION AND RESEARCH IN MALAYSIA

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### Introduction

The Malaysian Agricultural Research Development Institute (MARDI) was inaugurated on 28th October, 1969, under an Act of Parliament which was passed on 13th February, 1969, making it an autonomous body endowed with the functions of carrying out all agricultural research in Malaysia, and with adequate administrative flexibility required in creative and productive research, facilitating continuity for short and long term programmes.

### Functions of MARDI

The functions of the Institute as provided under the Act are as follows:—

- a) to conduct scientific, technical, economic and sociological research in Malaysia with respect to the production, utilization and processing of all crops (except rubber), animal and fresh water fisheries;
- b) to serve as a centre for the collection and dissemination of information and advice on scientific, technical and economic matters concerning agricultural industry, periodicals and papers relating thereto;
- c) to act as a centre for specialist extension service in the agricultural industry;
- d) to advise on the training of workers for scientific and technical research and extension;
- e) to provide grants-in-aid for the purpose of pure and applied scientific, technical and economic research concerning agricultural industry; and
- f) to maintain liaison with other organizations, both public and private, indigenous and foreign which are engaged in scientific, technical and economic, and sociological research concerning the agricultural industry.

### Research Structure

In early 1973, with the recommendation of the Scientific Council and the approval of the Governing Board, MARDI adopted a new research structure with the main purposes of achieving integration in inter-disciplinary approach and making MARDI a more effective research organization. Under the new structure, MARDI is composed of:—

- a) Crop Research Division
- b) Animal Research Division
- c) Soils, Water and Engineering Research Division
- d) Crop Protection Research Division
- e) Economics, Statistics and Project Development Research Division.

The branches created under each Division no longer reflect various crops or animals but they are based more on definite research disciplines e.g. Breeding and Selection Branch, Physiology Branch, Agronomy Branch etc.

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### **Leadership and Coordination**

In order to ensure proper planning and efficient implementation of research projects, each Research Division has a *Division Head* and each discipline a *Branch Head*, appointed from suitable scientific staff with the necessary qualifications and ability to provide leadership in carrying out the projects effectively. Each unit will have a Unit Co-ordinator whose main function is to coordinate all research activities assigned to the Unit.

### **Objectives of MARDI Research Programmes**

With the adoption of the new programmes, all research projects to be carried out by MARDI are constantly geared towards the objectives of the Malaysian Government's New Economic Policy as summarized below:

- a) restructuring of society through the process of correcting racial economic imbalances;
- b) reduction and eventual elimination of identification of race with economic functions;
- c) correction of regional economic imbalances;
- d) increase of the productive capacity of the disadvantaged through the provision of education, health, housing and other facilities; and
- e) generation of more employment opportunities through the adoption of labour intensive programmes and diversification of the economy.

### **Animal Research Activities**

Animal research is one of the responsibilities of MARDI. It consists of five major programmes covering beef, dairy, swine, poultry and fresh water fisheries, with the following objectives:—

- 1) to improve all classes of animals,
- 2) to maximize utilization of all available feedstuff and byproducts,
- 3) to evolve optimum management practices,
- 4) to maximize efficiency of production.

In order to achieve the above objectives, a combination of all the available disciplines covering genetics and breeding, physiology, nutrition, biochemistry and animal husbandry is adopted in all the research programmes, and in short, all programmes follow an interdisciplinary approach.

Within these broad objectives the overall performance of the animals in Malaysia viz. beef and dairy cattle, pigs, poultry, fresh water fishes and eventually also goats and sheep are being examined with the ultimate objective of maximizing productivity. This approach is in line with the Government's economic policy with a view to ameliorating the predicted shortage of animal protein in the years to come. To evolve improved breeds will take a considerable length of time, however this programme is included in the long term projections for different classes of animals in the country.

To attain self-sufficiency in animal products, Malaysia should not be dependent on imported feedstuff. Research is now being carried out to find out the performance of the local ruminants and non-ruminants that are available in the country, their efficiency to utilize available local foods and their reproductive capacity. As feed conversion efficiency is dependent on the type of diet, on breeds and lines between breeds and also good management practice, the combined effects of all these factors would only contribute to lowering the cost of production of animal protein. At the moment, though there is no Master Plan for agricultural development, the country has already embarked on agricultural development, the country has already embarked on agricultural expansion and

diversification programmes for the production of foods for humans and animals over the last decade. However, thoughts towards such an end are now being consolidated.

Research in the fields of management and husbandry of each species of animals for local environment are being carried out. Importance has been placed on evolving new management techniques in order to achieve the desired results for each type of animal performing specific function. Therefore studies on types of housing, feeding, watering, methods of preventive medication etc. are being conducted.

Maximizing efficiency of production requires contributions from factors previously mentioned, viz. suitable breeds or strains, good nutrition satisfying the physiological requirements of the animals, efficient management and husbandry. Approaches leading to increased production at minimum cost will also be investigated.

### Present Situation of Animal Industry

Malaysian agriculture has placed major emphasis on tree cropping, and therefore livestock economy has not yet had a chance to achieve its full potential, contributing only two per cent to the gross national product. Nonetheless, there is a thriving livestock industry, made up of pigs, poultry, cattle (beef and milch), buffaloes (beef and milch), goats and sheep.

Of these, the pig and poultry industries are quite advanced, achieving self-sufficiency, with additional possibilities for export. The livestock population in Peninsular Malaysia today is approximately 724,000 pigs, 304,000 cattle, 233,000 buffaloes, 332,000 goats and 38,000 sheep. Some idea of their individual contribution to meat production for example is as follows:—

Species	% Contribution	Value (million \$)
Goats and sheep (mutton)	0.8	4.3
Cattle and buffaloes (beef)	10.0	40.4
Poultry (meat)	40.0	132.9
Pigs (pork)	49.2	223.9
Total	100.0	401.5

Unlike self-sufficiency in pork and poultry products, there is considerable dependence on the importation of meat and milk products from ruminants. The present meagre domestic beef supply comes mainly from draught animals supplemented by imported swamp buffaloes from south Thailand, and frozen meats from Australia and New Zealand. The country is also considerably dependent on the importation of milk and products amounting to about 80 million dollars.

These figures serve to highlight the dichotomy within the livestock economy, with the ruminant sector lagging well behind. It is to correct this situation, and accelerate the output from the ruminant sector that the Government has given beef production top priority and embarked on a large scale programme of establishing several beef-dairy units in Malaysia. Such an approach underlines the importance of increasing the overall supply of protein from animal sources, including fresh water and marine fisheries.

The efforts of Government to go into expanded production from ruminants, has placed special responsibilities on the role of animal research to not only support and ensure the success of these basic objectives, but more important, sustain and further stimulate the contribution of animals as a whole. A start has therefore been made by the Animal Research Division within MARDI to identify priorities and embark on those research programmes in animals that fall within the framework of these objectives.

This is but the start of long-term and objective research, and in order to strengthen the efforts in this direction, specific long-term projects in cattle, buffaloes, swine, poultry and fish have been submitted to the Government for consideration.

### **I. Present Situation of the Beef Cattle Industry**

Very little organized effort has gone into beef cattle production in Malaysia. Although the country is approximately 90 per cent self-sufficient in beef, averaging about 4 kg per capita consumption, this supply is made good from the slaughter of imported buffaloes from south Thailand, from draught and Local Indian Dairy cattle (LID) slaughtered long after their productive usefulness, and frozen beef from Australia and New Zealand. The cattle that are slaughtered are those that have been grown on very extensive systems of management mostly on local native pastures.

The bulk of the beef supply have come from the indigenous Kedah-Kelantan cattle which in terms of draught and meat constitute approximately 80 per cent of the total population of some 310,000 cattle. Although there is some information on their field performance, no critical data exist on their potential productive capacity under improved management conditions. Together with Local Indian Dairy cattle, buffaloes, goats and sheep, these cattle which have evolved largely through natural selection constitute an important component of the overall animal industry in Malaysia.

#### *Beef Research*

The projects currently being undertaken in the beef cattle research programme are designed to assess the potential productive capacity of the local 'beef' cattle under improved systems of management and feeding, and the prospects for the production of superior animals for beef production possibly through selection and the introduction of imported semen from progeny tested bulls are attractive. However, selection and scanning within the locally available animals for superior 'genetic materials' will be a long-term projection. It is hoped that a National Breeding Programme be evolved centering around the locally available cattle and buffaloes.

Considerable attention has been directed towards assessing the nutritional value and prospects for the utilization of agricultural byproducts such as rice straw, pineapple wastes, sugar cane tops, bagasse, molasses and effluents from oil palm processing mills etc. for use in beef cattle feeding. Feeding and digestibility trials are being conducted on the utilization of these byproducts. Comparative studies on feed intake, growth rates, reproductive capacity and general performance of both local cattle and imported tropical breeds are being conducted.

Though Malaysia has been free of most of the infectious diseases like Foot and Mouth Disease and Rinderpest, attention may have to be directed towards instituting eradication programmes against Brucellosis and bovine tuberculosis which may be present in isolated areas. This field of research is under the purview of the Animal Health Branch of the Veterinary Services.

### **II. Present Situation of the Dairy Industry**

Dairy cattle farming in Malaysia is still in its infancy. The industry exists mainly as a system of backyard farms situated within towns or within a radius of ten miles from major towns and in estates. The owners of these herds are either government workers, plantation workers or businessmen, their herds being managed entirely by their family.

At present no fixed system of management exists. The animals are allowed to stray-graze. No form of pasture or fodder management exists and concentrate feeding made up of various ingredients in different proportions are given. The Local Indian Dairy cattle is an undefined group of cattle with a wide genetic base as shown by its wide

variation in yield, reproductive performance, temperament, body type and colour. As milk is a highly perishable commodity, an efficient method of handling is essential. The high cost of milk may be the end result of poor management of livestock and the existence of a relatively inefficient marketing system. Thus an attempt at reducing the cost of milk production may pave the way towards a successful dairy industry.

#### *Dairy Research*

As very limited facilities are now available at MARDI for dairy research, and pending establishment of permanent sheds, a national survey of the dairy cattle industry has been initiated with the objective of studying the availability, productivity and fertility of the Local Indian Dairy type cattle, and the management and feeding practices adopted by the local dairymen.

The possibility of introduction of imported semen from superior progeny-tested bulls will be explored as soon as some indication has been established with respect to the performance of the locally available dairy animals. Preliminary results have indicated tremendous variations in the performance of the Local Indian Dairy cattle which may lead one to suspect that they are neither a breed nor type but can be grouped as a heterogeneous lot.

The survey has indicated problems and difficulties faced by the dairymen. Taking into account the sociological factors of these small farmers, it is hoped that an economic sized herd could be recommended.

Development of tropical pastures and legumes fodder grasses, stocking rates, systems of fodder management and dairy cattle husbandry for maximum efficiency of utilization of pasture/legume are some of the special avenues for research that will complement cattle performance studies.

### **III. Present Situation of the Swine Industry**

Recent statistics indicate that the pig population of West Malaysia is about 724,000 heads and that the annual slaughter is approximately one million heads. The number of pigs produced has been increasing by about 10% per annum in the past decade. Pork supplies almost half the total meat consumed in Malaysia. The pig industry is becoming more intensified with the majority of pigs being produced on larger farms. However, over 50% of the pigs are produced on farms of less than 50 pigs.

The introduction of exotic or improved breeds of pigs has greatly changed the industry. Importations by the Government and by private individuals have gradually changed the indigenous pig population from the local to the improved breeds. These improved breeds are more efficient converters of feeds and produce faster gains in body weight with a more desirable quality of pork. However, they require a much higher standard of management.

The pig industry being a large consumer of prepared feeds, has stimulated the feed milling industry resulting in further development of the pig industry. However, the feed mills have to rely almost totally on imported feedstuff. This has become necessary because the supply of local feed ingredients has been very small and erratic. The total volume of feed ingredients imported annually for pig consumption is over 200,000 tons representing an expenditure of \$70 million.

#### *Swine Research*

The activities of swine research were limited to determining the suitability of utilization of locally available feed ingredients by pigs. This is part of a long range objective in reducing feed cost and also reducing the need for imported feed ingredients. Feeding trials have been carried out to determine the feasibility of incorporation of low quality whole or broken rice in feeds as a substitute for imported maize. Further trials will be conducted to determine whether rice is a practical ingredient in the diet of the

early weaned pigs. Work on determining the suitability of various parts of tapioca as components of feed, and techniques of overcoming their possible toxic effects at different ages will be carried out. It is hoped that studies on the nutrient requirements of growing pigs under Malaysian climatic conditions will be pursued with the establishment of permanent facilities.

A National Survey of the Pig Industry with the main objectives of identifying problems and immediate difficulties of the farmers has recently been completed and is awaiting publication.

The production of pigs has been curtailed to a degree due to scattered outbreaks of swine fever in the pig producing states of West Malaysia. Measures have been instituted by the Veterinary Department to control the disease.

#### **IV. Present Situation of the Poultry Industry**

Poultry production has become a large and a dynamic industry. Poultry and eggs provide one of the largest sources of agricultural income and the annual output of poultry meat and eggs was valued at about \$250 million in 1971. The industry also embraces other activities viz. hatchery-farm operation, feed-mill operation, drugs, equipment farmers, businessmen and workers are involved and dependent on this industry.

Malaysia's programme for self-sufficiency in rice production is still in progress. There seems to be a change in emphasis towards the production of expensive animal protein particularly from livestock. The per capita consumption of animal protein is still low in Malaysia compared to the developed countries. Increased investment in this sector will therefore lead to better nutritional standards and may bring about employment and additional income to farmers. The considerable quantity of animal feed ingredients being imported into the country poses a challenge to those involved in the industry to find ways and means to make the country self-sufficient in feed grains and thus make the poultry industry truly independent of imported feedstuff. There is therefore a great need for expanding the areas of crop cultivation which will provide opportunities for farmers to better their income.

The poultry industry has progressed rapidly over the last decade. The goal of self-sufficiency in poultry meat and eggs has been achieved. At the moment poultry meat and eggs contribute about 45% of the animal protein consumed (excluding fish). Local production has reached its plateau and it is difficult to push per capita consumption further due to various constraints, such as the relatively low purchasing power of the majority of the population and the high cost of production due to increased price of feedstuff.

##### *Poultry Research*

Research projects currently undertaken are directed towards reducing feed costs by substitution of imported feed ingredients with those locally grown. Local grains or cereals and agricultural byproducts are being tested and incorporated in the chicken feed. Feeding trials on direct substitution of maize with broken rice in broiler rations, and replacement of maize with broken rice and tapioca meal at varying proportions in the layer mash have already been initiated. It is also planned that other nutritional studies such as nutrient requirements of broilers and layers in tropical climate will be underway. Studies on the effects of withdrawal of starter mash at different ages of chicken growth and under differing management systems are also in progress. Research projects will include breeding and genetics, factors affecting growth, physiology of reproduction and, environmental, genetic and nutritional factors affecting meat and egg quality.

## V. Present Situation of the Fresh Water Fish Industry

Fresh water fish production has been estimated at about 20,000 tons in 1972 compared to about 200,000 tons for marine fish for the same year. At the moment, it is still a small industry, however, it has the potential to develop into a large one. The general population has developed a taste for a number of well-known varieties of fresh water fish including the giant fresh water prawns. Possibilities of utilizing natural ponds in the inland areas and also abandoned mining pools are being explored for the rearing of fresh water fish.

With the rapid development of land schemes in the inland areas, fish grown in ponds can provide substantial supplies of protein to families which otherwise may be denied such a valuable source of animal protein.

Indigenous fishes—*Clarius batrachus* (Ikan Keli or catfish), *Channa striata* (Ikan Aruan) and also the different varieties of carps are popular in this country and these constitute important sources of protein foods.

The aquarium fish industry is expanding rapidly throughout the world with supply falling short of demand. In 1971 Malaysia exported \$250,000 worth of aquarium fish. This low figure of export can be attributed to the relatively inadequate knowledge of the aquarium fish breeders in the techniques of mass production and breeding of those varieties which are in great demand by importing countries.

### *Fresh Water Fisheries Research*

Research programmes in fresh water fisheries include studies on pond culture of the common species of fish. These species of fish have at one time been a common protein source for the rural people. With the introduction of double cropping of padi, there has been a scarcity of these fishes in these areas and therefore alternative ways of rearing them have to be found. Fry stocking trials using suitable ponds and their nutritional and management requirements are being investigated. Studies on the giant fresh water prawns have also been carried out based on the method of polyculture. In this method it is found that both fish and prawns can be reared within the same space and thus could enhance the final yield of each. Studies on induced spawning of Chinese carps using whole fish pituitary glands have been attempted with some degree of success. With the expansion of the aquarium fish industry and attractive potentialities for export, studies on breeding and development of techniques for the commercial production of some species like Red Oscar, Swordtail, Angel Fish and others have been initiated.

## General Problems

Since Animal Research is a relatively new field in Malaysia, difficulties have been encountered in the selection of suitable research personnel. The number of graduates trained at the first degree level in the local University is even insufficient to meet the needs of the Government services. With the establishment of the University of Agriculture, it is hoped that the turnover of animal science graduates can be increased and they be encouraged to pursue post-graduate programmes towards the Master and Ph.D levels in specialized fields of animal physiology, genetics, nutrition etc.

Presently most of the senior research staff have had training in overseas institutions. However, efforts are being directed towards recruitment of locally trained animal science graduates and giving them specialized training while conducting specific research topics. There is therefore a great need for trained research personnel.

MARDI has its own training programme both locally and overseas and has established regional cooperation with other research institutes for short term specialized training.

Like any other newly established research institute we share the common problem of shortage of facilities and technicians, and as specialized equipment will have to be

obtained from other countries, delays and uncertainties in delivery of these equipments have been experienced. It is quite fortunate that the Malaysian Government has given MARDI adequate funds to run the animal research programmes.

Except for fresh water fisheries which is run on its own station, most of the animal research projects are being conducted in temporary buildings and sites. However, construction of new buildings, animal houses and laboratories on new sites are in progress. They should be functional by the middle of 1974.

Two stations, which are located in distinct parts of the country are being established for cattle and buffalo research. The construction of Central Headquarters-cum-Laboratory complex will be commenced in November 1973

It is hoped that by the end of 1974, with the return of research personnel from training overseas, the addition of newly recruited Animal Scientists, the completion of permanent sites and encouraged by the preliminary findings from the current research programmes, the Animal Research Divisions of the Institute will be in a position to advise the Government and private enterprisers on the establishment of animal enterprises in Malaysia and therefore will make a significant contribution to the development of the Animal Industry in the Tropics.

### **Discussion**

**N. Yamada, Japan:** You mentioned on the utilization of rice straw, pineapple waste, sugarcane tops, and other farm byproducts or farm waste. However, as I understand correctly, your country is producing not a small amount of cassava. If the cassava is being used as a feedstuff for cattle in your country, I would like to know what is the significance of cassava as the feedstuff in your country?

**Answer:** At the moment, no field trial has been carried out on supplementary feeding of cattle with cassava. However cassava chips and pellets are being tried in supplementing pig and poultry rations.

Cassava grows well in Malaysia and large scale production of cassava is possible if future market for the processed product is known. Processed cassava can be used as one of the main energy sources in feed formulations especially for pigs and poultry.