UNIVERSITI PUTRA MALAYSIA

A CASE STUDY OF THE JASIN MILK COLLECTION CENTRE (MCC) SCHEME
PART II
MANAGEMENT OF SMALL-HOLDER FARMS

RASHID BIN IBRAHIM

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MANAGEMENT OF SMALL-HOLDER FARMS

by

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A project report submitted in partial fulfilment of the requirements for the degree of Doctor of Veterinary Medicine (D.V.M.) in the Faculty of Veterinary Medicine and Animal Science, University Pertanian Malaysia.

March, 1978

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ACKNOWLEDGEMENT

The author wishes to record his thanks to his supervisor, Dr. B.G. Richard, and to his co-supervisor Dr. J.S. Young for his invaluable help and advice in the preparation of this report. Grateful thanks are also extended to the Director of Veterinary Service, Malacca Dr. Leong Yee Keong and his staff, the managing Veterinary Assistant of the Jasin Milk Collection Centre (MCC) Mr. A.A. Lingam and his staff, the Assistant Veterinary Officers of Jasin and Muar Encik Ibrahim bin Hj. Hashim and Encik Ibrahim bin Mahmood respectively and their staff, and the Veterinary Assistants of Merlimau and Tangkak Encik Yunus bin Abas and Encik Sharif respectively for their assistance in carrying out the project. The author also wishes to thank the Director General of Veterinary Services Ministry of Agriculture Malaysia Dr. S. Thuraisingham for his information on the MCC scheme. Last but not least the author wishes to thank all the Jasin MCC farmers whose cooperation made the survey possibl his 3 groupmates, Encik Ahmad Suhaimi bin Omar, Encik Khasim bin Awang Itam and Encik Chai Kim Kheong for their invaluable cooperation in making the survey and preparing the report, and Cik Napsiah Yasin for typing the final report.

Finally the author wishes to express his deep appreciation to his beloved wife, Halimah for her encouragement and for getting the draft typed by her and her friends. Indeed her constant prayer, encouragement and patience in bearing with him through the thick and thin during his 5 year study have been a source of inspiration to the author. Special gratitude goes to MARDI for sponsoring the author during his 5 years in the Universiti.

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ABSTRACT

When the Jasin MCC scheme was started on 27th November, 1974 only 46 farmers (100% Indians) participated. Now the number has increased by 7½ times. There were more than 20% Malays, 70% Indians, and 5% Chinese. The increase was attributed to the package dairy programme offered by the MCC.

The type of management practiced was studied by categorizing the farmers into two, namely estate type and the non-estate type.

It was found that the farmers average age was 40.5 years and literacy was high (63.0%).

There was a high demand for the X-bred cows and the production of X-bred by AI on local cattle. It was found that 63.1% calves and approximately 50% of the cattle were X-bred (where 40.8% had reached breeding age). But local bulls were not controlled.

Animal identification was not systematic. Post-natal care was lacking, and dehorning was not practised. Record-keeping was poor. A standard milking procedure to produce clean milk was done by most farmers.

The estate type cattle sheds were generally poorly built, over-crowded and poorly drained, compared with those in non-estate type. Cattle crushes were owned privately, communally or non-existant.

Farmers had problems with feed and water. No proper feeding regime was followed. Most of the farmers fed grass to their cattle cut from wherever available. Farmers travelled between 1-40 miles daily to collect grass. Animals were grazed under rubber, oil-palm, coconut, or on open ground etc. Grass establishment was minimal. Concentrate, molasses and other feed supplements were fed mainly to cross-bred cattle. Padi straw was used as an alternative, especially during the dry seasons.

However, cattle rearing in estates proved a problem to the estate management. The farmers greatly desire to expand their herd, to produce milk and to obtain supplementary income monthly. They need a better extension

CHAPTER 1

INTRODUCTION

The Department of Veterinary Services, the Ministry of Agriculture, Malaysia is to carry out the Livestock Development Programme under the Third Malaysia Plan (1976-1980), as its role in the two-prong New Economic Policy (to eradicate poverty and re-structure the society). One of the major roles of the department is to foster dairy production by small-holders and landless agricultural labourers, so that these be integrated into the existing mono-cultural pattern of land use.

It was realised that the major problems in dairy farming in Malaysia were:

1. The small number of the local cattle population (the local Indian Dairy, LID and Kedah/Kelantan beef-type, KK) and their low productivity;
2. inadequate grass and fodder;
3. high cost of concentrate feed;
4. shortage of trained personnel in modern dairy farming.

1.1 LITERATURE REVIEW

Mahendranathan (1975, 1976) reported that more than 85% of all cattle in Malaysia (Table 1)were owned by the small-holders and more than 70% of the cattle are owned by the Malays, but 99.2% of the cows were not milked. Poor returns provided no incentive to farmers. At the same time absence of natural grass-land and suitable fodder has impeded the rearing of larger numbers and better quality stock.

Thuraisingham (1977) mentioned that presently dairy cattle are kept in small numbers, widely dispersed and disorganised. Under the Livestock Development Programme of the Department of Veterinary Services, Malaysia, the eixsting dairymen could be organised through the "Intensive Dairy Development Area" (IDDA) concept. In this concept the Milk Collection Centre (MCC) will become the operational base to provide a package deal to farmers. The aims of the MCC scheme were:

1. to provide supplementary income of M$250 per farmer,
2. to create employment opportunities,
3. to intensify the utilisation of the fodder potential under tree crop and other monocultural use of land,
4. to improve the local cattle population.

(Refer Part 1)

A large number of animals could be carried on existing agricultural land without having to open virgin jungle for pasture development which could be very expensive. In the small-holder programme on the other hand, the capital required would be mainly for the purchase of cross-bred cows and the building of a simple cattle shed.

The cattle population, in the country, especially the dairy cross-bred, could be increased rapidly through massive imports of breeding animals (cross-bred), the establishment of large scale breeding farms and

the intensification of AI services. Samuel (1973) found that the local Indian Dairy (LID) herd had an average yield of 1472.2 lb compared with that of the Jersey/LID cross-breed of 2493 lb with a lactation yield of 260 days (8.7 months) and 312 days (10.4 months) respectively. The impact of cross-bred animals was very great, and news of their value spread very fast resulting in great demand for cross-bred cows and AI services. The demand for cross-bred animals came from all races including the Malays, who previously did not have dairy cattle nor any experience in maintaining and milking such animals. Hence training of Malays and supplying them cross-bred animals is essential.

It appears that with proper incentives, inputs and encouragement it would be possible to get the Malay farmers to milk their cows and thus add a new dimension to the cattle industry in th country. According to Mahendranathan (1977) this shows that the myth that the Malays cannot and would not accept dairying was slowly but surely being exploded.

Wan Mohammed et al (1976) outlined the efforts carried out by the Rubber Research Institute of Malaysia (RRIM) to study rearing of animals, including cattle, under rubber trees where abundant natural under-growth occurs. Livestock production in rubber small-holdings appears to be very promising. Sufficient feed can be grown for animals in the interrows of young rubber and in the old rubber areas, natural undergrowth can provide adequate feed if stocking rates are controlled. Further more heat stress is reduced for animals grazing under shade viz. under rubber, oil-palm or coconut.

de Guzman et al (1975) reported that several coconut plantation owners in the Philippines were running cattle very successfully on improved pastures growing under the palms. In Philippines, four grasses, had been tried under coconuts namely, Para grass (Brachiaria mutica), Guinea grass (Panicum maximum), Alabang (Dichanthium aristatum) and Napier grass (Pennisetum purpurem). The first three species hav been found to b

satisfactory. In Sri Langka, Brachiaria milliformis had been found to associate compatibly with coconuts. As far as legumes were concerned, Centroscema pubescens and Pueraria phoseoloides were used, Leucaena would also grow well in these conditions.

On the Jasin MCC dairy farming, two earlier studies were carried out. The first was done by Cawangan Ekonomi dan Perangkaan, Kementerian Pertanian Malaysia during the first half of 1976. The survey covered the dairy farmers in the whole of Malacca, which included the Jasin District. The survey identified the major constraints to the growth of the dairy industry, assessed the production levels and income derived from dairy farming and obtained information on the livestock husbandry practices of the small-holder farmers. The data was analysed according to the 3 districts viz. Central Malacca, Jasin and Alor Gajah (Northern Malacca). The survey pointed out that the main problems of the dairymen were the provision of adequate feed for their animals with shortage of grass, difficulty in finding areas for grass irvesti and the high cost of animal feed. Recommendations were made to improve the breeds of cattle with artificial insemination and the introduction of cross-bred animals; to extend credit; to improve extension services; better utilisation of land and resettlement; to check on the quality of feed and the introduction of a pilot project in Jasin.

The second study was carried out in May, 1977. A seven-man German team from the Post-graduate Training Centre for Agricultural Development, University of Berlin, did a three-month survey on the Jasin MCC. The data was analysed according to Estate workers, Kampong Malays and Non- alay Non-estate farmers. The report stated that the establishment of the MCC had stimulated milk production by the small-holders tremendously and had shown that dairy farmers were able to produce milk of high quality. The

dairy production systems were similar and uncomplicated forthe landless estate workers and individual farmers. It stressed the importance of the necessary production inputs for dairying plus dairy training and field extension service. A projected development and recommendations for the Jasin MCC were made. Among them were the improvement in the forage situation, the control and acceleration of the breeding programme and the introduction of a livestock recording system.

1.2 OBJECTIVE OF THE CASE STUDY

The five-week survey in this case study was undertaken to identify and analyse the different management practices of the dairy small-holders in the Jasin MCC scheme.

CHAPTER 2

MATERI L A D METHOD

A total number of 352 farmers had taken part in the Jasin Milk Collection Centre (MCC) Scheme up to the period of interview.

A random stratified sample of 20% of the total number of farmers who had taken part in the scheme (from 19 localities or areas) was decided upon by the four undertaking the study, (Fig. 1 and Table 2). Initially, we visited all the areas involved in the scheme. A sketch map was drawn and used in our travel.

A set of questionnaires (Appendix E) was prepared and personal interview of the farmers at their farms was carried out for 5 weeks (December 5, 1977 to January 7, 1978). The farms spread across almost 2/3 of Malacca, stretching from the Negeri Sembilan border to Johore (Tangkak and Muar included). The interview covered 570 miles. The farmers were categorised into two, based on location for reasons of analyses and comparison, (Table 3) viz. The estate type (rubber tappers, oil-palm workers and other estate workers residing in estates) and the non-estate type (rubber small-holders, padi-planters, small businessmen, orchard fruit owners, coconut small-holders, pensioners and others non-residing in estates).

The management practices and farm conditions were observed and reported. As no proper records were maintained by most of the farmers, it was necessary to rely on the farmers' memory for the required information. Hence some margin of error should be allowed.

Other people interviewed were the Director General of Veterinary Services, Malaysia, two estate managers, veterinary assistants and non-participants in the dairy scheme.

CHAPTER 3

RESULTS

When Jasin MCC was started on 27th November, 1974 only 46 farmers (100% Indians) participated by selling their surplus milk to the MCC. By the period of interview, the number of participants had increased to 352. Table 4 shows the breakdown of the increase of scheme participants according to races. The change is considerable, showing that more Malays and Chinese are taking part in the MCC scheme. It was interesting to note that only 19.4% of the farmers were full-time dairy-men.

3.1 THE REASONS FOR THE INITIAL PREDOMINANTLY INDIAN PARTICIPATION

Some of the reasons cited were that the consumption of fresh milk among the Malays and Chinese was not popular.(7) This could be due to the fact that dairy farming among these people was never a tradition, and traditional dairy farming was not remunerative.(7) Furthermore, modern dairy farming practices and technology were not introduced to the farmers, and they were not aware of the advantages of dairying as compared to traditional beef cattle (Kedah-Kelantan type) and buffalo rearing.

3.2 THE MCC PACKAGE PROGRAMME (16)

However the favourable change seen presently was encouraging, which could have resulted, among other things from the package programme offered by the Veterinary Department, (Appendix A). This is in line with the recent theory of development and extension which suggest package deal for farmers.(21)

Most of the farmers who joined the scheme knew of the scheme and its advantages through the MCC officers (52.9%), the Veterinary Department officers (37.1%), and visits to model farmers and neighbouring farmers (10%).

3.3 EDUCATION

Literacy among the farmers was high (63.9%) as 69.6% had completed primary education and 30.4% had been exposed to some secondary education.

Mahendranatham (1976) pointed out that the educational standard was an important factor in determining the level of farm development in using new skills and new knowledge to make livestock keeping more profitable. However, he argued that the key to better husbandry lay in the better economic returns. Does it provide the small-holders the necessary incentive to improve his livestock?

3.4 AGE AND EXPERIENCE

The average age of the farmers was 40.5 years. (range 19 to 74 years). Among them 12.7% were bachelors with 2 teenage girls as participants. Generally the Indians have dairy cattle experience (average 13.9 years) before they joined the MCC scheme (96%). While 50% of the Malays had previous experience with beef cattle, 2 out of 17 Malay farmers interviewed had previous dairying experience (average 7.8 years), none of the Chinese had previous dairy cattle experience, and only one out of the four Chinese interviewed had previous cattle and goat rearing experience, prior to joining the scheme.

We found that 10% of the farmers had experience in rearing other animals besides cattle, of which 8.6% had reared goats or sheep, and 1.4% reared commercial poultry (broilers), The Chinese in this study area could not rear pigs (pigs could only be reared in certain areas of Malacca) because the area was a padi area and the population was predominantly Malays. Padi plants could not tolerate pig dung and Malays being Muslims did not tolerate rearing of pigs. In addition to dairy cattle, 14 farmers (19.4%) reared other animals, among which 28.6% were cattle (75% pawah scheme cattle), 71.4% goats or sheep and one farmer reared commercial poultry.

Those farmers who had reared commercial poultry broilers changed to dairying because they believed that dairying income was stable and high, and the management practices were easier as compared to broiler rearing.

3.5 TRAINING

In order to be able to purchase the pregnant cross-bred cows from Institute Haiwan Kluang, it was a pre-requisite for the farmers to attend Dairy Training Course, and to build a minimum standard cattle shed. Meanwhile those who had been dairy farming had to first join the scheme by selling their milk to the MCC.

Approximately 20% of the farmers had attended the two-week farmers' Dairy Training Course, and 16.7% had attended the two-month Stockman Training, both at Institute Haiwan, Kluang. During the period of training board and lodging were provided. The practical-oriented training included feeding and animal management (cows and calves), some veterinary procedures, techniques of milking cows, heat detection, artificial insemination, and grass establishment.

The remainder who did not attend the formal training (63.3%) were the Indians who already had an average experience of 13.9 years of traditional dairying.

Those who attended the two-week course stated that the course was adequate (75.6%) while the remainder stated it was inadequate and suggested follow up courses and demonstration on the farm.

3.6 ASSISTANTS IN DAIRYING

The survey revealed that 12.5% of the participants were bachelors whose average age was 24 years (range 19 to 38 years). Farmer's Assistants in dairying were as shown in Tables 5 and 6. The result indicated under-employment of family labour.

3.6.1 Wife

The wives helped to clean the shed, provide drinking water and feed supplements. Only one of the farmers wives helped to milk the cows, none of them helped to cut grass or look after the cattle at grazing

(except the hired herdsmen who may be a woman). The wives helping in dairying were keen to get supplementary income for the children's education and survival.

3.6.2 Children

The average number of farmers' children was 4.5 Malays, 5.5 Indians and 6.5 Chinese, (range 2 to 13). The percentage of children helping their parents in the dairying activities (cut grass, clean shed and graze the animals) was 34% Malays, 39% Indians and 15.4% Chinese. All the Chinese employed assistants which was a reflection of the small percentage of the children helping their parents.

3.6.3 Hired Assistants

Only 42.9% of the farmers hired helpers in their dairying activities of which 20% cut grass and 80% acted as herdsmen (100% in estates). Only one farmer hired an assistant to assist in all his dairy operation. Sixty-two point nine percent of the farmers used subagents to market their milk. This may have been due to the distance of their farms from the MCC or merely for convenience.

3.7 DAIRY CATTLE

Most of the Malay participants (72.2%) joined the scheme at the beginning with two heads of dairy cattle, whereas only 44% of the Indians and none of the Chinese started with so few animals. The Indians, being traditionally dairy-orientated already had more dairy cattle at commencement. At time of interview 68% of the Indians had X-bred animals. All the Chinese and 94.12% of the alays had X-bred animals. The Chinese, being the economically stable group, started with an average of 8.8 heads of dairy cattle (range 5 to 14).

The farmers bought subsidised X-bred cattle from the Institute Haiwan, Kluang (74.9%), 12.4% from people within the scheme and 12.7% from Singapore. The cross-bred animals were of many breed types namely, crosses of local cattle (the LID and the KK) with Friesian, Jersey, Australian Illawara Shorthorn, or even Droughtmaster. The vast majority were Friesian and Jersey half breeds.

The dairy population composition and herd size are recorded in the economics section of the survey (Part IV).

Approximately 50% of the cattle in the survey area were cross-bred animals but only 40.8% were cows of breedable age (the last report from Ministry of Agriculture stated one third of the cows were cross-bred). However 63.1% calves were corss-bred. Hence AI and the introduction of pregnant cows has substantially increased the number of cross-bred animals. The request for AI has also increased (refer Part I). This indicated a favourable response towards improving the local cattle population. Further monitoring would measure the success or otherwise of the programme aimed at local cattle improvement.

3.8 MANAGEMENT PRACTICES

3.8.1 Identification

All adult X-bred animals purchased from Institute Haiwan, Kluang were identified with ear-tags and tattoo. Those animals tested for TB, Johnes Disease, Brucellosis and vaccinated against hemorrhagic septicemia (HS) were ear tattooed, but the farmers used names to identify their cattle, even in large community herds. To the farmers, identification was for the purpose of ownership only.

But for AI records, ear-tattoo and tags (if unavailable, names o attl
were used.

3.8.2 Post-natal care

Farmers did not use iodine to dip the umbilical cord after a calf was born. The recently-calved cows were very well cared for especially by the Indians

3.8.3 Dehorning

Dehorning was not favoured by 96% of the Indians but favoured by all the other groups who were willing to pay for the service if available. The farmers mentioned of the dangers working with dairy cattle with horns especially when their wives and children were helping to handle the cattle. The reasons given by those Indians not willing to dehorn their cattle was stated to be the esthetic value and also their religious beliefs.

3.8.4 Cattle-sheds (Plate I)

One of the pre-requisites of being allowed to buy the X-bred cows from Institute Haiwan, Kluang was to have a minimum standard cattle shed.

3.8.4.1 Design

We found that generally the sheds owned by those who had just commenced dairying (48.6% of the total) were better in design and materials. Farmers on the estate management type (the estate workers) built their sheds in a communal area allowed by the estate management. In those communal areas, the cattle sheds were like "cattle-ghettoes or slums". The sheds were over-crowded, close together, low roofed, and made of scrap wood, guni-sack and pieces of zinc. Most floors were of trampled soil and sloped towards the drain but the drainage was generally poor, without proper exit of flow.

Farmers in the non-estate management had sheds in their backyard. The designs and materials were generally good. The sheds were spacious and the roofs made of good material (zinc or attap) with cement flooring and good drainage. Table 7 summarises and compares the farmers' cattle shed construction. The grass feed troughs were either placed in the middle or at the sides of the

sheds. Most of the feeding troughs were raised above the floor (67.2%). Most of the sheds had a storage place to store grass, concentrate, other supplements, molasses and medical kits.

The calf pens were separated or partitioned and a few had raised floors.

3.8.4.2 Goat/sheep shed

Among those farmers who also reared goats or sheep (10% estates, 13.6% non-estate), 40% of estate and 100% non-estate had separate goat sheds. Sixty percent of the estates had goat sheds alongside the cattle sheds.

3.8.4.3 Cattle crush

A cattle crush was communal (14%) only in estates. Thirty six percent of the estates and 63.6% of the non-estate had their own cattle crush. Sixty percent of the cattle crushes were reliable and 40% required improvements. If a cattle crush was not available the cattle were tied to posts or trees.

3.8.4.4 Daily routine

Every morning the sheds were cleaned before milking. After milking the cows were tethered outside the shed except in some open areas where cattle were kept indoors until time for grazing. Estimated manhour per farm per farmer per day was 5.3 hours and 2.0 hours where a hired assistant was available.

3.8.4.5 Dung disposal

The disposal of dung seemed to be a problem in both types of manag ment. No deep pit was dug to dispose of dung for later removal except in 16% of the estate and 40.9% of the non-estate farms. As a result the dung was deposited outside the shed and in some areas was 2 - 4 feet high. The situation was worse in estates where sheds were located in a crowded cattle shed area. However, some farmers collected the dung on a communal basis and sold it as fertiliser (14% estates, 13.6% non-estates) or used it themselves for fertilising their own fruit trees, grass plots or vegetable plots (estates 10%

non-estate 45.5%). In one case the dung was used in a fish pond.

3.8.4.6 Control of insects

Sheds were cleaned of dung to avoid flies during the day. At night mosquitoes were kept away from cattle by burning left-over grass to produce smoke.

3.8.5 Breeding (Plate II)

All the farmers interviewed seemed to know the signs of heat, citing mounting, vaginal discharge and red, swollen vulvae as the common signs observed. Heat was detected by the farmers or their assistants at milking, at holding area and while grazing. Most farmers knew that cows could ideally be inseminated within 60 days post-partum, but only a few cows showed heat before the 60-day period. Where bulls were loose and grazed with the herd no control or recording were possible.

Heifers were first inseminated at 3 years of age for LID and 2-2½ years age for X-bred. Most farmers were aware of the disadvantages of early mating in heifers.

Yearling bulls, not planned to be used as bulls, were castrated and sold as beef animals.

3.8.5.1 Artificial insemination

Pregnancy occurred in an average of 5 inseminations. (range 3 to 7). A bull was used when pregnancy had failed after an average of 5 inseminations. The fertility of X-bred cows was a problem. Purebred dairy bull semen (Friesian and Jersey) was used to inseminate the LID and KK. First crosses will be inseminated with Australian Milking Zebu semen in order to keep the exotic gene level near the optimum 50%.

3.8.5.2 Bulls

Bulls for breeding were kept only by estate farmers (19.4%). Some farmers had to hire bulls for mating their cows. Seventy-one point four percent (71.4%) of the bulls were LID and the remainder were X-bred (28.6%).

The bulls were mated at 2-2½ years of age on the average. No vasectomised bulls were used as teasers. In the estates, where bulls were kept continuously with cows and grazed collectively by a hired herdsman, AI could never be effective. Two farmers reported raising 50% X-bred bull calves to assist in future breeding and to prepare for the time when free A.I. ceased.

3.8.5.3 Pregnancy Diagnosis

Most farmers were aware that cows should be pregnant as soon as possible after partur tion to avoid delay in milk production and to avoid losses. Only 10% of the farmers had their cows tested for pregnancy which was requested only when cows did not return to heat 7-9 months after breeding or when pregnancy was not obvious.

3.8.6 Records

Only 12% of the farmers interviewed maintained records. All of them had daily milk production records of his farm but none had individual cow records. Records on the cost of concentrate and other supplement was sometimes maintained. However it was difficult to get a reliable record.

3.8.7 Milk Production

Milk production was the main concern of the farmers. All farmers mentioned the dual advantage of rearing dairy cattle - the milk production and the expected yearly calves. The colostrum period (monitored by milking separately cows which has just calved until milk is accepted by the MCC) in the LID averaged 13.4 days, and in the X-bred averaged 7.4 days. The lactation length for the LID was 5.9 months on the average and 11.5 months for the X-bred, with a maximum daily yield of 5.05 lbs for the LID and a maximum daily yield of 11.7 lb for the X-bred. The reasons given for a drop in milk yield were shortage of grass in a dry season and shortage of concentrate due to a late delivery which could be as long as 2 weeks. Only one farmer overcarried the concentrate.

3.8.7.1 Missed Milking

Some farmers had missed milking their cows some time during the lactation period (54% in estates and 63.6% in non-estate). The reasons were:

1. they had important work to do and no alternative milker was available. This occurred only in the non-estate management (18%);
2. Electrical supply was interrupted (due to underground cable damage) and farmers have been warned not to send their milk to the MCC (estates 36%, non-estate 45.5%).

3.8.7.2 Milking Procedure (Plate III)

All the cows were first suckled before they were milked. Only X-bred cows were washed before milking. All cows were hand milked. (Milk hygiene is dealt with in the health section Part III of the survey). The calves were confined in calf-pens all day and released to suckle 2 minutes on each of the 4 teats, and then tethered in front of the dam while the milking was completed. The calves were released again after milking was completed to suckle whatever milk was left (estimated at about 1 lb). The milking time (per cow averaged 10 - 15 minutes) was at about 6am and 5.30 pm.

After grazing in estate herds, cows knows by habit where to assemble for milking. Farmers normally milked their own cows. In the estates dairymen neighbours helped to milk if farmers were away.

If the calf died, the farmer tried to milk the dam daily until it dried off. The Indians would not milk a cow that lost a calf because of traditional beliefs.

3.8.7.3 Milk Rejection

Among the 72 farmers interviewed, 61% indicated non-colostrum milk being rejected at some stage of lactation.

Reasons given were:

1. Failure of acceptance test (estates 30% non-estate 22.7%);

2. Electrical supply interrupted (for farmers in Jasin District only) (estates 34%, non-estate 50%).

The first cause may lead to rejection for 1-2 days only, without recurrence. Electrical cut-off may persist for 2-4 days, as frequently as 3 times monthly.

The rejected milk was given away or used either as drink for the family, made into condensed milk, candy, Indian food ("thiru"), and ghee. Some was given to calves and the surplus thrown away. A few farmers reported not knowing what to do with the surplus rejected milk.

3.8.7.4 Drying-off Procedure

Generally all farmers knew the udder drying procedures. When it was time for drying the cows off the cows were milked in the morning only for 2 days. This was followed by alternate mornings twice, then every second morning on two occasions and then stopped completely. This was normally at 8 months pregnancy in X-bred and 5 months in LID if the animal had not already ceased lactating. No intra-mammany infusion was used.

3.8.7.5 Future Plan

Most of the farmers interviewed wished to increase their stock of dairy cattle (estates 62%, non-estate 59.1%). The maximum number of milk cows the farmers wished to achieved ranged between five and ten, with the ultimate aim of having all X-bred cows. In their expansion programme, only one farmer wished to use a portable milking machine. Those who wished to increase their cattle were willing to work harder and increase man-power, feed concentrate to their cows and expand the sheds.

3.8.8 Feed and Water

3.8.8.1 Water

None of the farmers provided water ad lib. Water was provided before each milking in the morning and in the afternoon. The lack of water,

and more likely the lack of advice were the likely cause of this practice. In the estates, where cattle shed area was a distance (more than 200 yards) from the farmer's house (25.7%) and piped water was mainly used as cattle drinking water, after grazing in the evening cattle went to their owners' quarters to be given water with feed supplements in slurry form. In the morning farmers and their assistants carried water plus supplement in pails to the sheds. Meanwhile the calves were only given some of the dams' milk after being milked, up to weaning. If the dam died calves were bucket fed.

3.8.8.2 Concentrate and molasses

Feed normally consists of cut unimproved grass plus concentrate with or without molasses and there may be other supplements. Farmers varied the quantity of concentrate and molasses according to age groups and functions by estimation.

A proportion of the farmers fed molasses (average 1 lb/cow/day) to their milking cattle (estate 66%, non-estate 90.9%). They related the high milk production to the feeding of concentrate and molasses. Only one farmers fed concentrate and molasses three times daily, the rest fed twice daily prior to milking. One hundred percent of X-bred cow owners fed the cows concentrate (at 5 - 8 lb/cow/day) with or without molasses. Cows in milk were given the higher level of concentrate. Calves were fed with about 1 lb concentrate/ calf/day.

The concentrate was supplied by Sin Heng Chan & Co. through the MCC (Table 8 shows the composition of concentrate). Late supply was reported to occur. Each time it occurred, milk production per cow dropped by about 5 lb. A definite step to improve this situation is essential.

There was a lack of a defined feeding regime for th farmers to follow.

3.8.8.3 Other Supplements

Only two farmers mixed their own concentrate formula. One reported being reprimanded by the MCC for doing so! The cost of the concentrate mixture was cheaper than the commercial concentrate, but the farmers reported milk yield comparable to feeding with commercial feed. The following ingredients were used: rice bran, biscuits, sesamum cake, groundnut cake, copra cake, oil-palm kernel, and crushed maize. Other farmers (38.9%) fed different proportions of above ingredients as supplement to the commercial concentrate. It was common for the farmers to give rice-washing water to their cattle, mixed with these feed supplements.

3.8.8.4 Salts and Minerals

Only 22% among estates and 54.5% non-estate farmers used salt lick which contained all the necessary salts and minerals for cattle. However 98% and 80% of estate and non-estate farmers respectively fed common salt to their cows at approximately ½ kati (or 0.7 lb) adult cattle/day. It is desirable to add 1 to 1.5% salt to concentrate mixture.(14)

3.8.8.5 Grass - Cut and Carry (Plate (IV)

All farmers used the cut and carry system to supplement grass at the night and morning feed. Only at one location, Diamond Jubilee Estate, were the farmers not allowed to graze their cattle under the rubber trees.

Grass was normally cut at any place by farmer himself (60%), children (44%), hired men (10%). Only 3 farmers cut the grass on alternate days and these three had only 2 adult cattle. Most of the people went out to cut grass between 12 noon to 3 p.m. Only 2 farmers refused to cut grass if it rained (an Indian man and a Malay youth).

Grass was abundant under rubber trees, oil-palms and coconuts except in Tangkak where the grass was sprayed with weedicides under rubber trees. Farmers had to travel far between 1 to 20 miles away to cut grass. A motorcycle was used commonly.

Bicycles were also used in a few cases. Most farmers intended to purchase motorcycles in the future to ease the transportation of grass. However only three farmers complained about a lack of grass to cut. These farmers, with greater effort and some investment on a motorcycle could overcome this problem.

The quantity of grass cut depended on the number of cattle. Padi straw offers on alternative and was used as supplement by 4 farmers. A semi-intensive farmer in Air Molek stacked padi straw up to 3 years and fed the cattle daily in addition to grass and concentrate. (Plate IV No. 4). The cattle were introduced to straw at an early age. The other farmers used padi straw when it was available and they stocked up for use in the dry season (January, February and March).

(a) Grass Establishment

Grass establishment was minimal. Only 6 farmers reported planting some grass which was mainly Napier, and some Guinea grass. The area was small ranging from a 80 feet by 100 feet plot, to a 3-acres plot which may be open ground, under fruit trees, in rubber plots, disused padi fields, and areas around cattle sheds. Fertilizer was used in the form of cattle dung, chicken dung as well as chemical fertilizers. According to Mahendranathan (1974), Malacca had only 70 acres of grazing reserves but had 24,125 heads of cattle and buffaloes. The ratio was 344.64 animal per acre ! The State was studying a project to plant grass on irrigation canal banks in Merlimau for fodder.

(b) Grazing

he holding area (Plate V) for estate type management was around their shed compound which may be under the estate rubber trees, oil-palm or open ground set aside by the estate management for the cattle sheds (Table 11). In these holding areas wooden sticks or long metal poles were driven into the ground leaving 2-3 feet above the surface, where the cattle were tethered

after milking in the morning until being sent for grazing at noon. In some very open and hot areas cattle were kept in-doors until grazing time.

In the non-estate management, the cattle were kept, after milking, around their sheds in the farmers backyard which may be either under fruit trees or rubber trees.

Generally the cattle were grazed at noon but grazing may be as early as 11 a.m. or as late as 2 p.m., depending on who sent them for grazing. (Plate VI). In the estate hired herdsmen graze the community cattle at 11 a.m. Morning grazing was not practised as cattle can be grazed under rubber trees only after the latex has been collected at noon. Furthermore most of the farmers were part-time and hence could only send their cattle grazing in the afternoon. Those who reared goats, send them together with cattle for grazing. They graze as far as two miles away. The cattle return from grazing half hour before milking time. They were fed concentrate.

Those who let their cattle freely to graze were at risk. The estate management may impose a fine of $10 - $15 by cutting from their wages if they were estate workers and sometimes the cattle would be rounded up for police fines ($15 - $20 per head). Cattle can only graze under oil-palm and rubber trees over 5 years old. Sometimes neighbours were not able to control their temper and showed their anger indirectly to the cattle by slashing, throwing acid or hot water, and beating the unsuspecting beast! However some neighbours with cattle cooperated in the cattle management and assisted when farmer was away.

(c) Estate Management Problems (Plate VII)

One estate management refused to allow even cutting of grass let alone cattle grazing or rearing in the estate. One estate even dug up deep drains around their oil-palm estate. Reason given by the estate management for this apathy were:

1. Loss of cups and cup-lumps from the estate (rubber),

2. Depletion of cover-crops,
3. Compaction of the soil by grazing cattle,
4. Damage to drains by grazing cattle,
5. Damage to cocoa plants, rubber tree bark and oil palm leaves by cattle,
6. Health hazard of cattle dung to workers in the workers' quarters if they rear cattle around their quarters.

Another estate interviewed complained of similar problems but it took a more lenient stand allowing cattle grazing and cutting of grass though it suffered losses. Apart from the above, this estate had to chemically spray cattle dung to prevent rhinocerus beetles from breeding and damaging the oil palm shoots. Police action on loitering cattle was ineffective. The manager suggested the estates being approached and the granting of passes for grazing or cutting of grass.

3.9 EXTENSION ON DAIRYING

3.9.1 Extension Information

An inadequate extension service was the main complaint (estate 70%, non-estate 36.4%) of the farmers. Farmers required more information on dairy calf management, feeding and the latest developments in dairying. Farmers suggested more information be distributed through newspapers, magazines, pamphlets, radio, and television. They m tioned the lack of extension pamphlets from the Veterinary Division compared with other agencies.

3.9.2 Confidence in the Scheme

Among the 72 farmers interviewed 61% from estates and 84.7% from non-estates, were confident that they would be successful in the scheme. Those who were pessimistic gave the reason as shortage or a lack of grazing ground. This is not a sound reason because other farmers can go as far as 20 miles a day to cut grass.

The girl farmers stated if they m ried they would probably leave

the scheme even though they wished to continue. The other sisters and their father would take over and continue dairying. Meanwhile the pessimistic youths were looking for stable work, and if this eventuate, they would leave dairying.

The Indians on the other land generally would not sell their cattle even if they were in financial need. They would find oth sources of income before selling their cattle. Only one Indian farmer sold some cows to continue his children's education.

Two non-participants who were traditionally rearing beef cattle were interviewed in Tangkak, and mentioned that they did not know about the benefits of the MCC scheme and were not clear as to how to go about entering the scheme. If more people knew about the scheme 94.4% of those interviewed said more would join the scheme. Those who stated otherwise gave their reasons as lack of interest and unwillingness to work with cattle. However this may not be true because interest and willingness to work depends very largely on the renumeration..

3.9.3 Representation of the Farmers

Farmers were well represented on the Executive and the Milk Collecting Committees which administer the MCC.

The three participants of the MCC - the Federal Veterinary Department, the State Veterinary Department and the farmers, were represented on the Executive Committee which was responsible for the planning and evaluation of the scheme. In the Milk Collecting Committee the farmers were represented together with the subagents who collect the milk. This committee ensures a smooth functioning milk collection.

Annually the farmers met in a General Meeting to discuss their problems and decide on competition award winners. Table 12 shows th competition contested by the farmers. The prizes might include veterina roducts, salt lick blocks, bags of concentrated, or pregnant cross-bred cattle. This became great incentive for participating farmers to increase their efforts and improve their management practices, while encouraging more farm rs to join the scheme and improve their income

CHAPTER 4

DISCUSSION

4.1 RECORDING

Efficient farm management demands the keeping of good farm records. A more systematic approach to dairying has to be initiated by the MCC. A start should be made on a record keeping system for the farms. Since most of the farmers or some members of their family were literate, a recording system could be introduced at this stage. Before the start of each month, each farmer could be given a cyclostyled sheet (both pages) for simple record-keeping data. The data should include details of all stock carried, heat detection, mating and calving dates, stock sales and purchases, rates and types of supplementary feed, daily milk yield per cow, and records of any procedures introduced or carried out on the farm.

These sheets could be submitted to the MCC for compiling after the end of each month.

4.2 IDENTIFIC TION

A help towards accurate record keeping would be ear tattooing and ear-tagging. In future this procedure should be carried out and should be a rule for all newly born calves. Since farmers would not be prepared to pay for such practices, funds could be tapped to buy ear tags. This would not interfere with tattooing made by the herd-health team from Institute Haiwan Kluang.

4.3 DEHORNING

This practice must obviously be introduced immediately, especially for calves, even if farmers have to pay for the service.

4.4 SHEDS D THE DUNG DISPOSAL

Great effort must be made in this line. "Cattle slum" situation in estates must be improved through extension and planned rules.

Since farmers are now very keen to continue dairying and are aware of its value, changes can be imposed. Estate management can be approached for more suitable areas where better designed sheds can be built with proper ventilation, feeding space and dung disposal. Regulations on clean, well-constructed sheds have to be introduced to ensure milk quality.

4.5 BREEDING

Local bulls must be controlled. Only exotic bull crosses should be used, and other bulls must be castrated (to be sold) or vasectomised to be used as teaser bulls in heat detection. The use of pregnancy diagnosis should also be encouraged even if farmers have to pay for such service.

4.6 MILK PRODUCTION

Cross-bred cattle should be introduced to milking without calf suckling stimulation. Milk replacers should be used for calves. To utilise rejected milk farmers should be taught alternative uses of milk. A generator should be used when electricity fails so that losses to the farmer would be minimal.

4.7 FEED AND WATER

Standardised feeding should be recommended by the extension workers. Feeding should correspond to milk production. Table 13 and 14 show the recommendations for feeding. Actual feed measurement must be demonstrated (e.g. a scoop of feed weighs how much?). Water ad lib should be encouraged. An adult cattle drinks 3-4 lb water per day for each pound of dry matter consumed and another 3 to 4 lb per lb of milk produced.

Since the main source of concentrate was from one factory, the MCC should ensure that there is no interruption in the supply of concentrate. Quality control should always be monitored by the Farmers' Committee with the help of Institute Haiwan Kluang.

Grass should be established and maintained where possible, while the fodder potential under plantation crops could be utilised through a better relationship between the Farmers' Committee and estate management. According to Ani Arope (1976) animal or cattle rearing under rubber will indirectly save a portion of $57 million spent on weed control on the 2.2 million hectares (5.43 million acres) of cultivated rubber.

Further study of pasture under coconut, rubber, oil-palm and irrigation canal banks should be carried out. Padi straw should be introduced widely to feed cattle, possibly with the use of molasses and urea. Lowe, 1968 (as cited by Wan Mohamed, 1976) has shown that grass like Panicum spp, Axonopus spp, Paspalum spp mixed with Mikania spp, Mimosa spp and ficus are found growing abundantly in the interrows of mature rubber trees.

Lowe 1968 (as cited by Wan Mohamed, 1976) also stated that the grasses/weeds not only grow abundantly under old rubber trees but are also rich in crude protein (Table 9). The values of crude protein and crude fibres are comparable to cultivated tropical grasses when cut at 6 weeks interval (Table 10).

These findings, proved contradictory to that made by Whyte, (as cited again by Wan Mohamed, 1976) stated that "wild tropical grasses are notoriously low in protein content, even at their optimal stage of growth, for most of the year they are little tter than straw."

In areas not under rubber, morning grazing should be encouraged. In Muar, grass along irrigation canals stretching for 3 - 4 miles could easily carry more cattle. More extension work has to be carried out in this area.

4.8 EXTENSION SERVICES

This should compliment the training of the farmers. The extension material should be simple, easy to read and to understand. The transfer

of technology is likely to be more successful where the small-holders are already used to dairying and here training could be beneficial. They would then became familiar with simple management practices. However, acquired skills or knowledge will be ineffective without incentive.(9)

Thus there is a need for extensive and programmed extension service to all areas under the Jasin MCC, including Merlimau, Tangkak and Muar, which are predominantly Malay areas.

Finally, dairy activity in the Jasin MCC can be filmed for extension purposes so that other farmers from other MCC areas can benefit and follow the example set in Jasin.

The high proportion of the farmers who not only intend to remain in milk production but also to expand is an expression of their confidence in the future of dairy farming.(2)

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APPENDIX A

The MCC Package Programme

1. The establishment of milk collecting and cooling centre, and marketing the milk so that there is an assured market.
2. The supply, at subsidised price, of cross-bred cattle (maximum 2 heads per farmer) with an insurance scheme.
3. Easy term bank loans are available from 2 major banks (Bank Pertanian and United Asian Bank).
4. The provision of free artificial insemination (A.I.) services.
5. The availablity of an almost prompt veterinary and advisory service close to the farmers.
6. A steady supply on credit of molasses and concentrate to the farmers.
7. The availablity of abundant grass (though unimproved) in the area, and at a later stage, the establishment of grass.
8. The availablity of training for farmers in dairy management and practices.

APPENDIX B

Fig. 1 Map Showing The Jasin MCC Area, Malacca

[Not to Scale]

ESTATE AREAS

1. Bk. Asahan Estate H. Div.
2. Bk. Asahan Estate D. Div.
3. Air Tekah Estate
4. Rim Estate
5. Bekoh Estate
6. Diamond Jublee Estate
7. Tebong/Kemuning Estate
8. Bertam Estate
9. Merlimau Estate
10. Serkam Estate
11. Kempas Devon Estate
12. Union Estate
13. Jasin Estate
14. Paya Mas/Ledang Estate
15. Serom Estate

NON-ESTATE AREAS

16. Merlimau Town
17. Tangkak Town
18. Muar Town
19. Jasin Town

APPENDIX C

Table 1.

Cattle Population and Distribution in the Peninsular Malaysia (1975)*

State	Agric & Draught	Total	Milch Cattle				Total no of Cattle
			More than 3yrs		Less than 3yrs		
			Male	Female	Male	Female	
Kedah	66,766	9,134	778	3,761	2,054	2,541	75,900
Perlis	7,010	1,247	73	663	188	323	8,257
Kelantan	106,557	901	325	241	115	220	107,458
Trengganu	50,885	370	67	138	71	94	51,255
Pulau Pinang	10,081	1,961	155	806	415	585	12,042
Perak	7,288	20,315	1,011	8,984	3,609	6,711	27,603
Selangor	7,779	14,964	861	6,211	3,474	4,418	22,743
Pahang	17,020	2,496	165	1,053	496	782	29,516
N. Sembilan	17, 372	7,333	530	3,236	1,274	2,293	24,704
Melaka	9,242	2,722	100	1,307	590	725	11,964
Johor	20,122	3,059	368	1,542	417	732	23,181
W. Persekutuan	-	1,366	83	769	93	421	1,366
TOTAL	320,121	65,868	4,516	28,711	12,796	19,845	385,989
PERCENTAGE	82.94%	17.06%					

* Livestock Statistics Peninsular Malaysia, Econs. & Stats. Section, Ministry of Agriculture Malaysia (Veterinary Division).

Table 2. Localities in the MCC Scheme and the Number of Farmers Participating and Interviewed

	Locality	*No. of Farmers Participating	Farmers Interviewed TOTAL	M	I	C(√)
1.	Bk. Asahan Est. H. Div	52	10	1	9	-
2.	Bk. Asahan Est. D. Div	10	-	-	3	-
3.	Air Tekah Est.	17	-	-	2	-
4.	Rim Est.	9	2	-	2	-
5.	Bekoh Est.	8	2	-	2	-
6.	Diamond Jublee Est.	7	-	-	3	-
7.	Tebong/Kemuning Est.	34	7	-	7	-
8.	Bertam Est.	7	1	-	1	-
9.	Merlimau Est.	19	-	-	5	-
10.	Serkam Est.	18	4	-	4	-
11.	Kempas Devon Est.	12	2	-	2	-
12.	Union Est.	10	4	-	3	1
13.	Jasin Est.	10	2	-	2	-
14.	Paya Mas/Ledang Est.	12	2	-	2	-
15.	Serom Est.	7	1(50)	-(1)	-(47)	1(2)
16.	Merlimau Town	36	6	6	-	-
17.	Tangkak Town	9	1	1	-	-
18.	Muar Town	9	3	3	-	-
19.	Jasin Town	66	12(22)	6(16)	4(4)	2(2)
	TOTAL	352	72	17	51	4
	PERCENTAGE		20%	23.6%	70.8%	5.6%

* No definite record was available to indicate those farmers who have so far joined the MCC, those who have no milking cows and do not sell milk to MCC, and those who have left the scheme.

(√) M - Malays

I - Indians, including Sikhs and Pakistanis

C - Chinese.

Table 3. Analaysis of Interwiewed Participants by Occupation

	Number	%
Part-time	58(z)	80.6
Full time	14	19.4
Total	72	100.0
Pensioner	10	13.9
Estate rubber tapper	32	44.4
Oil Palm worker	2	2.8
Estate worker	10	13.9
Rubber small-holder	2	3.6
Coconut small-holder	2	3.6
Padi planter	3	4.2
*Others	4	5.6
Small Businessmen	10	13.9
Jobless	3	4.2
Total	(√)78	110.1%

(z) including two youth organisations

* Others included Penghulu (area headman), driver, carpenter.

(√) Some participants had more than one occupation.

Table 4. Monthly Total and Percentage of Participants Selling Milk to MCC(1977)

	Januari		Febuari		March		April		May		June	
	ABS	%	ABS	%	ABS	%	ABS	%	ABS	%	ABS	%
Malays	62	21.54	66	22.62	69	20.42	63	20.68	74	23.64	75	22.95
Chinese	15	5.20	15	5.13	18	5.84	19	6.22	19	6.07	22	6.72
Indians	204	70.83	203	69.15	213	69.15	213	69.83	218	69.64	228	69.72
Others*	7	2.43	8	2.73	8	2.59	10	3.27	2	0.65	2	0.61
	288	100%	292	100%	308	100%	305	100%	313	100%	327	100%

	July		August		September		October		November		Disember	
Malays	86	24.43	72	23.76	71	24.48	67	23.76	73	26.16	77	24.76
Chinese	19	5.40	15	4.95	18	6.21	17	6.03	15	5.38	18	5.79
Indians	245	69.60	214	70.63	199	68.62	196	69.50	189	67.74	213	68.49
Others*	2	0.57	2	0.66	2	0.69	2	0.71	2	0.72	3	0.96
	352	100%	303	100%	290	100%	282	100%	279	100%	311	100%

*Sikhs, Pakistani are categorised as Indians in Table 2.

Table 5.

Family Assistants to the Nine Bachelor Farmers

	Absolute	%
Father	9	100%
Mother	4	44.4
Brother	2	22.2
Sister	1	11.1
Hired	1	11.1
Total	16	188.8%

Table 6.

Assistants to the Remaining 63 Farmers

	Absolute	%
Wife	19	30.2
Children	41	65.1
Hired	19	30.2
Total	79	125.5%

Table 7. Farmers' Cattle Shed Construction Comparison

	Estate	Non-Estate
Shed		
Sawn wood	24	50.0
Scrap wood	56	36.4
Jungle wood	28	13.6
Low roofed	60	27.3
Zinc roof	70	59.0
Attap roof	16	36.4
Scrap roof material	24	4.6
Cement floor	46	72.7
Good drainage	16	50.0
Feed trough (grass)	84	50.0
Calf-pen		
Separate	46	63.6
Raised floor	12	13.6
Goat Shed		
Separate (reared goat/sheep)	40 (10)	100.0 (13.6)
Cattle crush		
Communal	14	0
Own	36	63.6
None	50	36.4

Table 8.

a) Cattle Concentrate Commercial Mix (Sin Heng Chan Co.) Guaranteed Analysis

			Per 100 kg. or lb. of feed (kg. or lb.)	Digestion* Coefficients, %	Digestible Nutrients (kg. or lb.)
Crude Protein	Min	14.0%	14.0	75.0	10.50
Crude Fat	Min	8.0%	8.0	53.9(x2.25)	9.70
Crude Fibre		8.15%	8.15	73.9	6.02
Ash	Max	8.0%	8.0	-	-
Moisture	Max	13.0%	13.0	-	-
Calcium		0.8-1. 4%	0.8-1. 4	-	-
Phosphorus		0.7-1. 0%	0.7-1. 0	-	-
Nitrogen Free Extract		42.49%	42.49	80.6	34.25
			Total Digestible Nutrients (TDN)		60.47

b) Trace elements - Copper, Magnesium, Zinc, Cobalt, Sulphur,

Added: Antibiotics, Multi-vitamin, Microminerals, Antioxidants.

Hence, 1 kg of concentrate contains 0.6047 kg TDN.

1 lb of concentrate contains 0.6047 lb TDN.

*Values are only assumptions adapted from a digestion trial. Source: Newlander, J.A. and Jones C.H., The Digestibility of artificially dried grass, Vermont Agr. Expt. Sta. Bull. 384, 1932 (as cited by Maynard, L.A., et al 1969. Animal Nutrition 6th Ed. Tata McGraw-Hill Co. Ltd.)

Table 9.

Chemical Composition of Herbage Under Rubber*

Chemical Composition	Percentage
Ash	7.47
Crude fibre	29.80
Crude fat	6.27
Crude protein	14.44
Starch	0.23
Sugar	2.52

* Sample taken from herbage found under mature rubber in field 17, RRIM Experiment Station (RRIES) Sg. Buloh, (1975). Composite sample was Paspalum conjugatum, Axonopus compressus, Ottechloa nodosa, Mikania cordata, Mimosa pudica, and some fern spp. (as cited by Wan Mohamed, et al 1976).

Table 10. Chemical Composition of Some Promising Grasses in Malaysia*

		Cutting interval	DM Yield ton/ha/yr	D.M.%	C.P.%	C.P.%
1.	Napier grass (Pennisetum purpureum)	6 weeks	10 - 12	14-12	15-18	26-30
2.	Star grass (Cynodon plectostachyus)	6 weeks	10 - 11	18-22	16-17	28-30
3.	Gattor Panic (Panicum maximum)	6 weeks	10 - 11	19-23	16-18	30-32
4.	Green Panic (Panicum amaran)	6 weeks	10 - 12	20-24	11-13	30-33
5.	Para grass (Brachiaria mutica)	4 weeks	16 - 32	16-22	14-18	24-26

Source: Tan, Yeow and Pillai (1973), Pontential pasture production and development, (as cited by Wan Mohamed, et al 1976)

* Cultivated and cut at six weeks interval

Table 11. Comparison of Holding Areas and Grazing Areas in Estate and Non-Estate Management

	Estate		Non-Estate	
	Holding Area	Grazing Area %	Holding Area %	Grazing Area %
Rubber	28.0	66.0	18.2	50.0
Oil palm	8.0	34.0	-	9.1
Fruit trees	-	-	50.0	4.5
Coconut	-	-	9.1	13.6
*Open ground	38.0	1.0	4.5	40.9
Inside shed	26.0	-	18.2	-
	100%	101%	100%	118.1%

*Open ground

a. For holding cattle:

   Area around cattle sheds in estate set aside by the estate management for cattle shed.

b. For grazing:

   1. Road-side

   2. Disused padi-fields or river banks

   3. Reserves along irrigation canals.

Table 12. Jasin MCC Farmers' Annual Competition

Type of Competition	Criteria for award
1. Best group of estate farmers	Programmed milk production Use of AI Clean milk production Farmers organisation Sheds situation
2. Best individual shed	Suitable size and dimension Construction design Cleanliness Feed and water troughs Water Lighting
3. Best farmer with LID cattle	No. of cattle Physical condition of cattle Feeding Use of AI Milk production
4. Best farmer with X-bred cattle	Physical condition of cattle Feeding Milk production according to genetic potential Use of AI
5. Best farmers using AI for breeding	No. of calves from AI Condition of calves Feeding Medication Use of AI
6. Best milk subagent	Record-keeping Organisation & participation in area Cooperation with MCC Programmed milk production Milk Quality His involvement in the scheme
7. Milking technique and hygiene	Cleaning of udder Milk utensils used Let-down and milking technique Restraint of cows Feeding of cows while milking Regularity.

Table 13.

a) Recommended Calf Feeding Schedule*

Age	Milk	AMT.% BW	Concentrate	Forage
0 - 3 days	Colostrum	8 - 10	-	-
3 - 14 days	Whole Milk	10 - 12	Offer	Free Choice
2 - 6 weeks	Whole Milk	12 - 15	Free Choice	Free Choice
6 - 8 weeks	Whole Milk	8 - 10	Max. 5 lb	Free Choice
8 -12 weeks	Whole Milk	4 - 6	Max. 4 lb	Free Choice

* Calf feeding Schedule at Universiti Pertanian Malaysia as cited by Nor Aida et al, (1978). Universiti Pertanian Malaysia Dairy Herd. Final year D.V.M. Thesis.

b) Replacing whole milk with milk subsititute(16)

i) replacement is done when calf is 2 - 3 weeks old,

ii) the change-over from whole milk to milk subsititute is carried out over a period of 4 - 6 days to avoid digestive upsets.

c) Weaning and Post-weaning

Weaning is done at 12 weeks old.

Calves are fed free choice grass plus a maximum of 4 lb. Concentrate.

Table 14.

Recommended Cow Feeding Scheme

a) Growth of heifers for herd replacement(14)

Bodyweight		Feed*		Protein		Energy (TDN)		Contentrate(x)	
kg	lb	kg	lb	kg	lb	kg	lb	kg	lb
25	55	0.4	0.9	90	80	0.4	0.9	0.66	1.5
55	121	1.2	2.6	180	145	0.9	2.0	1.5	3.3
100	220	2.9	6.4	370	260	2.0	4.4	3.3	7.3
300	661	7.5	16.5	640	395	4.5	9.9	7.4	16.4

b) Maintenance of Mature Lactating Cows(1)

400	882	5.5	12.1	521	245	3.1	6.8	5.1	11.2
500	1102	6.5	14.3	638	300	3.7	8.2	6.1	13.6
600	1323	7.5	16.5	734	345	4.2	9.3	6.9	15.4

* Estimates, since total amount depends upon the forge: concentrate ratio; as fed (90% dry matter) ba is.

(x) Calculated based on estimated TDN values of commercial concentrate supplied by Sin Heng Chan & Co., where the digestion coefficient % was assumed (Table 8) resulting in a high level of concentrate recommended, (The digestibil ty coefficients for concentrates are much higher than that for dried grass). This table should just serve as a guide. An actual digestibility trials have to be conducted.

c) Steaming-up ration for pregnant cows[10]

Weeks before calving	Expected peak yield of cow			
	20lb	30lb	40lb	50lb
6	-	-	-	-
5	-	-	-	2
4	-	-	2	4
3	-	2	4	6
2	2	4	6	8
1*	4	6	8	10

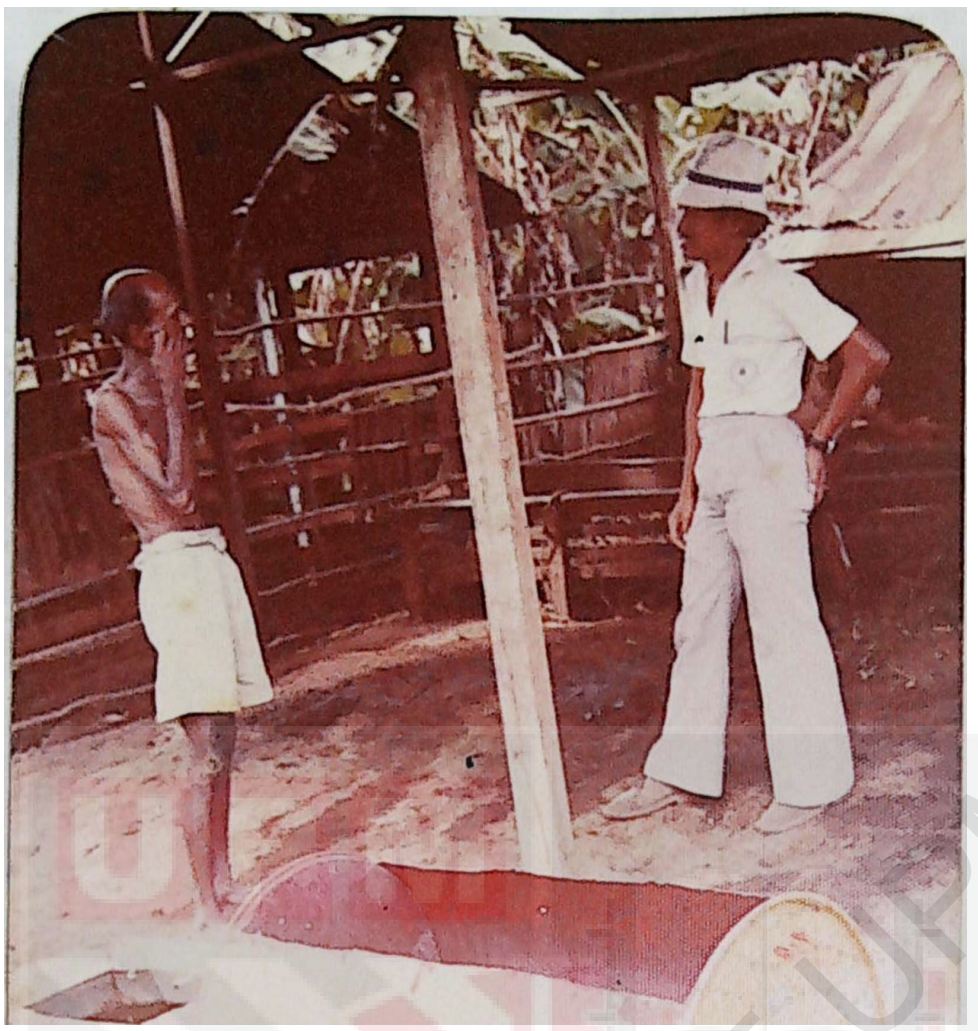
* There days before calving the amount of concentrate is cut down (by 1.5 - 2 lb) and a little warm rice bran mash fed to keep the cow laxative before calving.

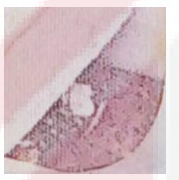
d) Ration for Milking Cows[16]

i) From the first day of calving 4 lb concentrate is added to maintenance ration.

ii) This ration is increased by 1 lb per day until the amount exceeds the daily milk yield by 1 lb ie. concentrate for 2 lb of milk.

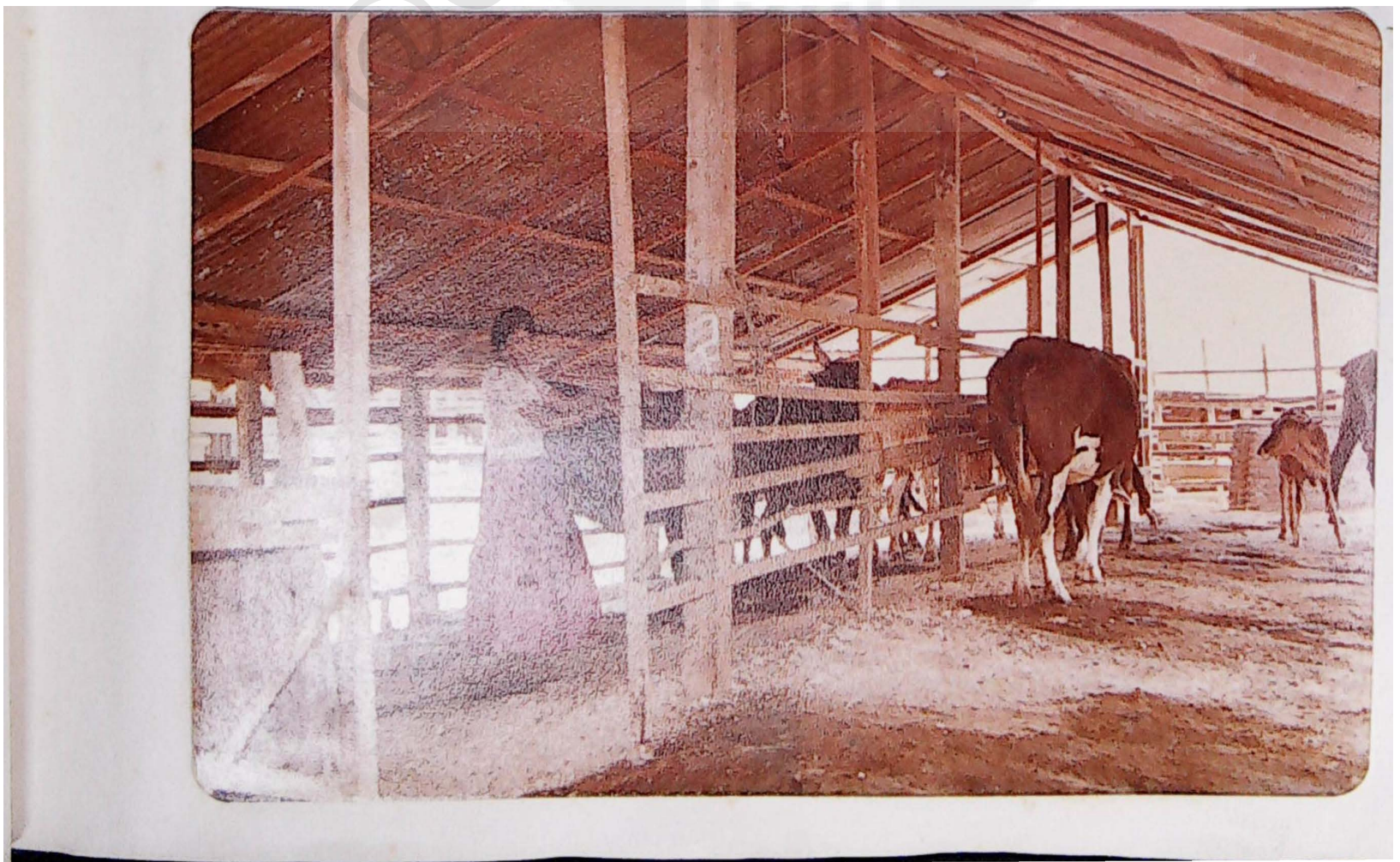
THE DIFFERENT TYPES OF CATTLE SHEDS.





1. (Above) The author interviewsan Indian farmer in his cattle shed in Payalas Estate. Note trampled soil, floor, spacious and clean shed. The container is used to store water to wash The Cattle.

2. (Below) One of the better cattle shed in Bt. Asahan D Div. Estate. Note the zinc roof and sawn wood construction. But the floor is not cemented and the roof is low.



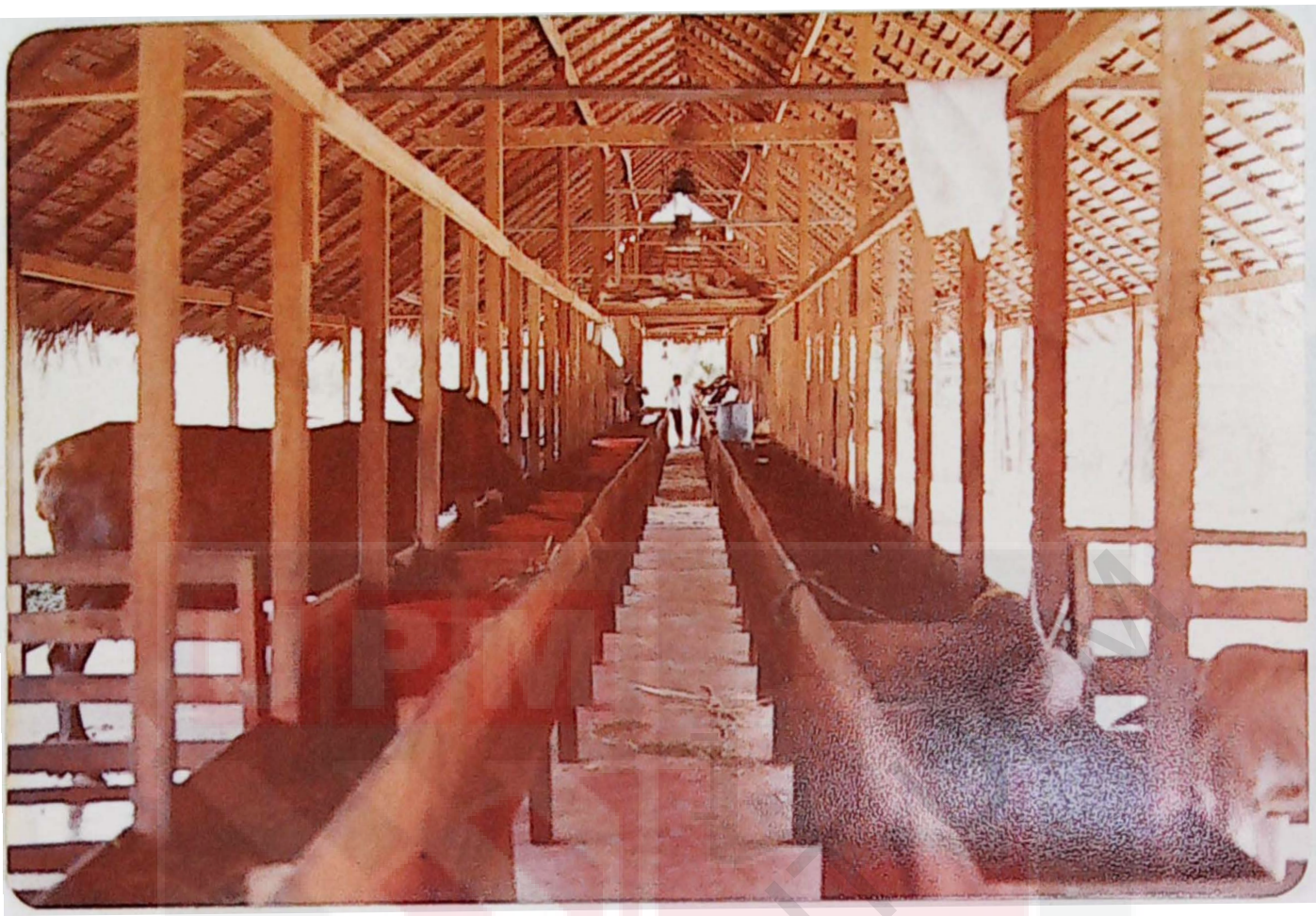
A Kampung Malay cattle shed in the backyard. Notice the attap roof and the jungle wood use for construction. The floor is cemented and the calf-pen is partitioned on the left. The fruit tree canopy provides shade for holding the cattle before the afternoon grazing.

Another Kampung Malay cattle shed in the backyard. Notice the attap roof, cement floor and jungle wood construction material. The grass feeding trough is raised. The water container in the background. Concentrate, molasses and other supplement are mixed in water and fed to cattle. This feeder design deposit (not shown at lower left corner) to dispose of cattle dung, which can be removed later.

A well constructed shed belonging to a achelor Encik Md. I or Kosai in Kuar.
Notice the cem nt floor, zinc roof, sawn wood and separate and raised calf-pen. Cleaning equipment and water container can also be seen.

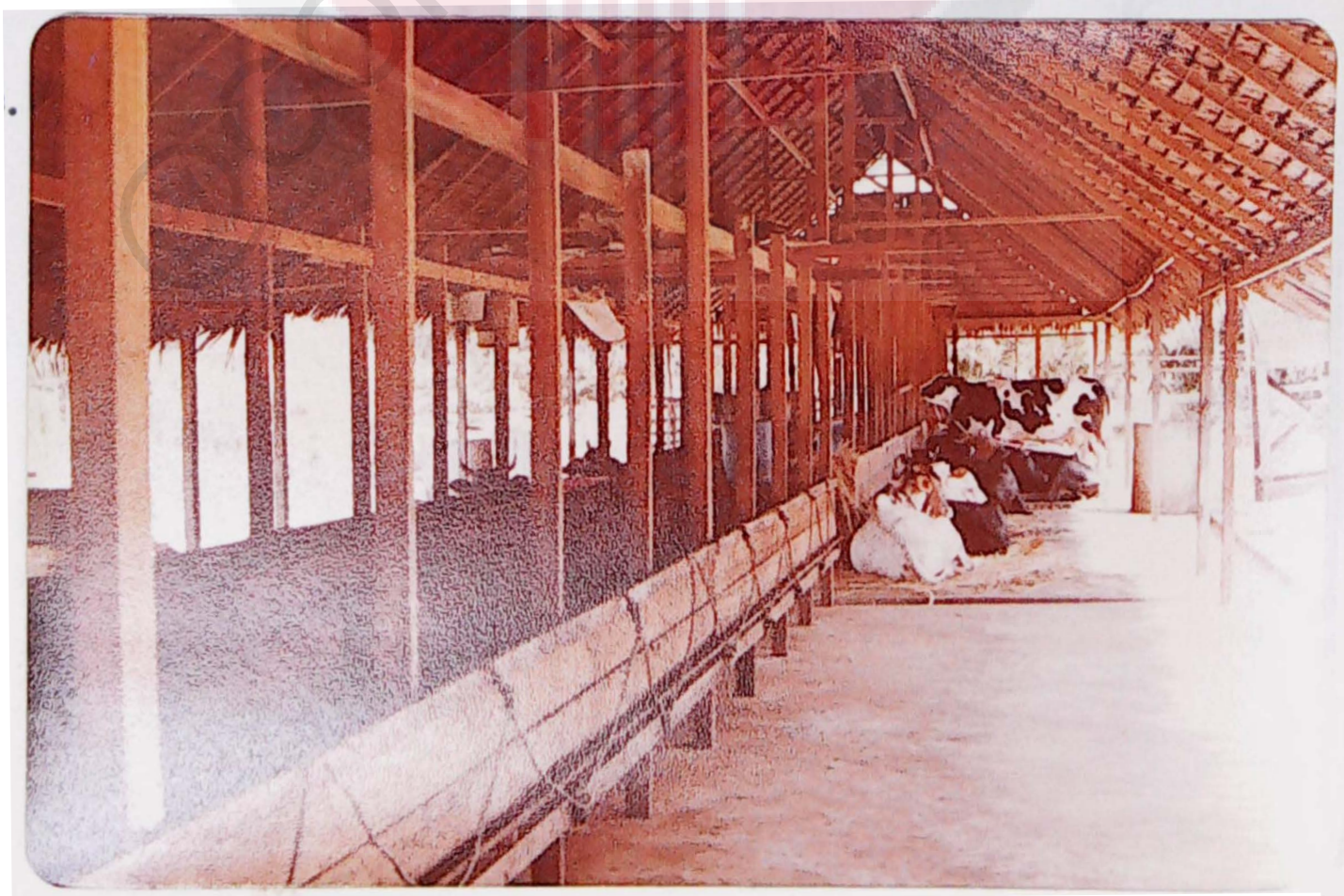
6.

A shed belonging to G rakan Belia B rsatu, Tekel, a Chinese youth movement. N tice the sh d was not suitably place at t oot o slope. " wever th location is cool und r ru er-trees.



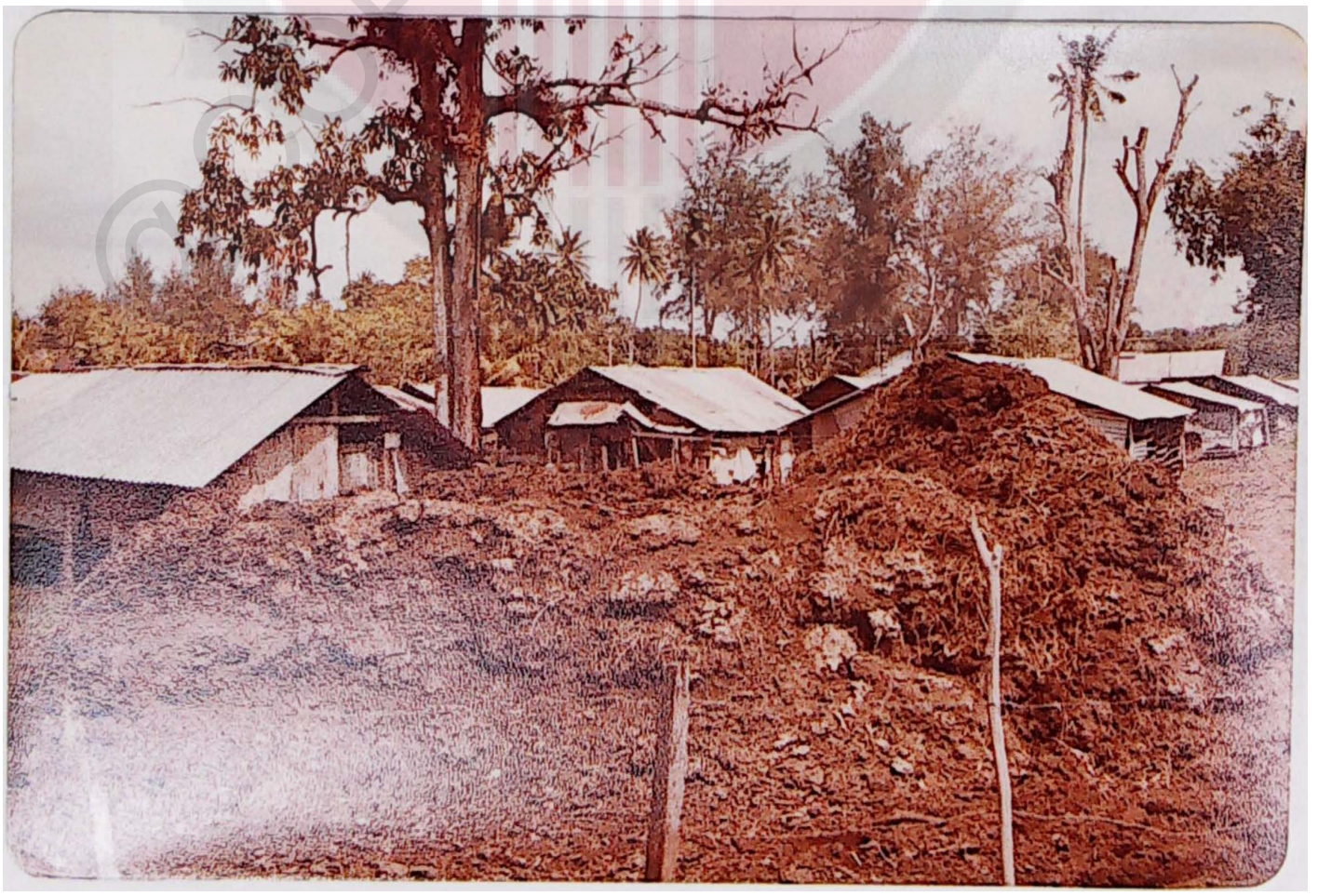
7. A Semi-int s em c le she in Air Nol k.
o ic the ed led with attap roof, cemen floor and
sa n wo mat rial. It as built y s ,o ak
note o p ace , rai d e in tro with indivi-
d cattlc in buc e individual ready- i ed neck ropes
ttac o t e f ed b low).

Padi s r w s f to h cat le es can be served below



Cattle shed in estates.
Notice the poor arrangement of the sheds, the low roofs and the scrap materials used for construction.

10 Picture below also shows heaped cattle dung 7 feet high outside the sheds. This place was actually lit ered with cattle dung. And in wet seasons fa ers reported the place became very muddy.



II BREEDING

1. More cross-bred cattle is hoped to be produced using A.I. on the local cattle, the Kedah-Kelantan (K.K.) beef typ (above) and the Local Indian Dairy (LID) shown below.
Note the simple goat-shed (bove) and the barbed wire and wood ences o separate each farmer's cattle after grazing for milk ng the evening (below)

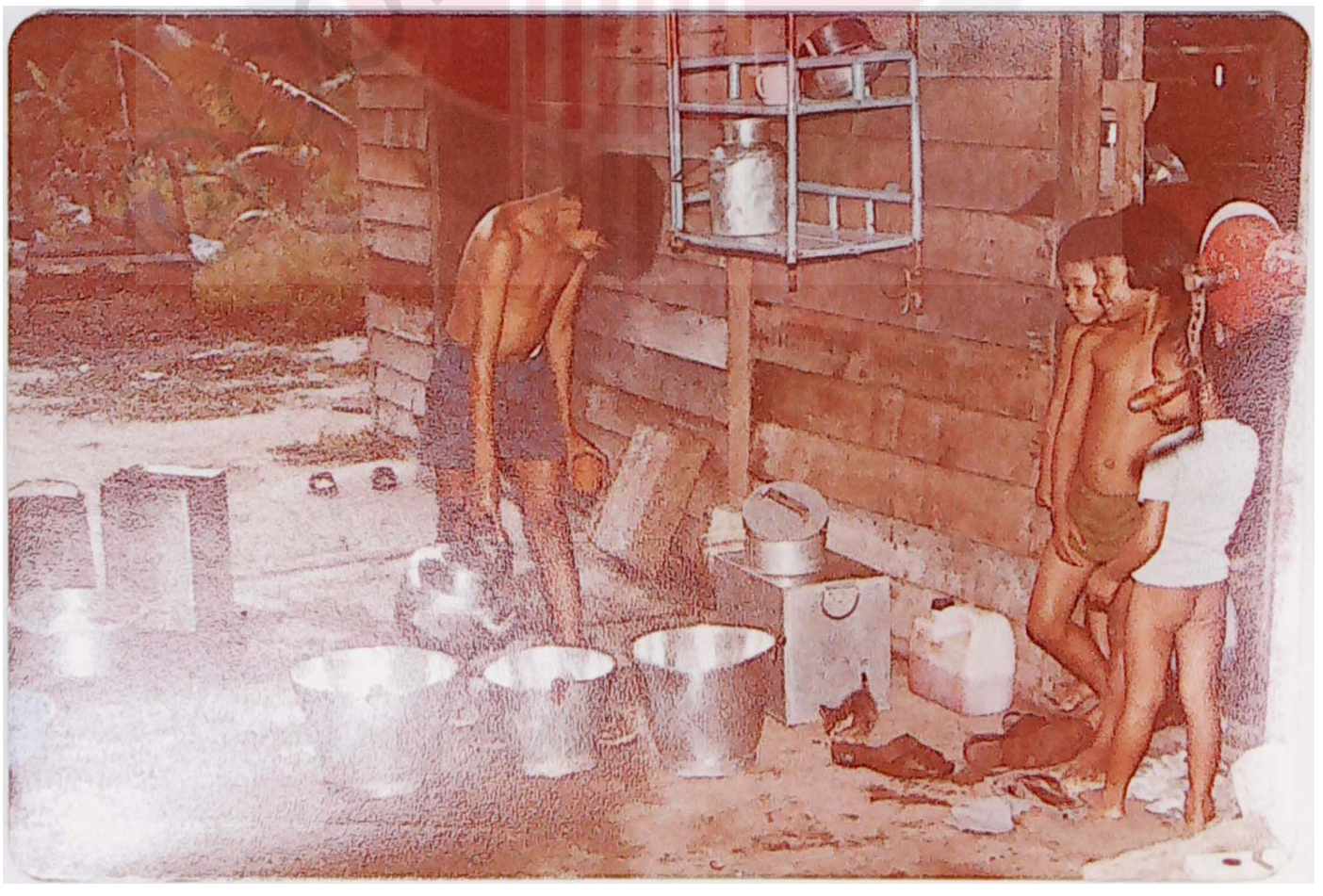
III A FARMER DAILY · LAING TINE.

(Above) A Malay farmer Ali Hassan in Merlimau, is bringing in his cows for the evening milking. Note the building on the left is the farmer's simple house.

2. (Below) The farmer is feeding his cows concentrate in water mixed with molasses, common salt and other supplements (eg. broken biscuits before ilking.
Note the salt licks hanging in the cent e.

3 (ove) Me while,the farmer's children wash the cows while hey are fed with supplements. Notice that the calf only share supplement fed to its am.

4. (Below) The chi dren are preparing the milking utensils. Hot wate is d to cle he cow's u der and milk utensils.
Mo e the circular file with a turning handl (on the right of picture) used by fa er o s pen t pp' g knive of tappers daily (for a s all fee).

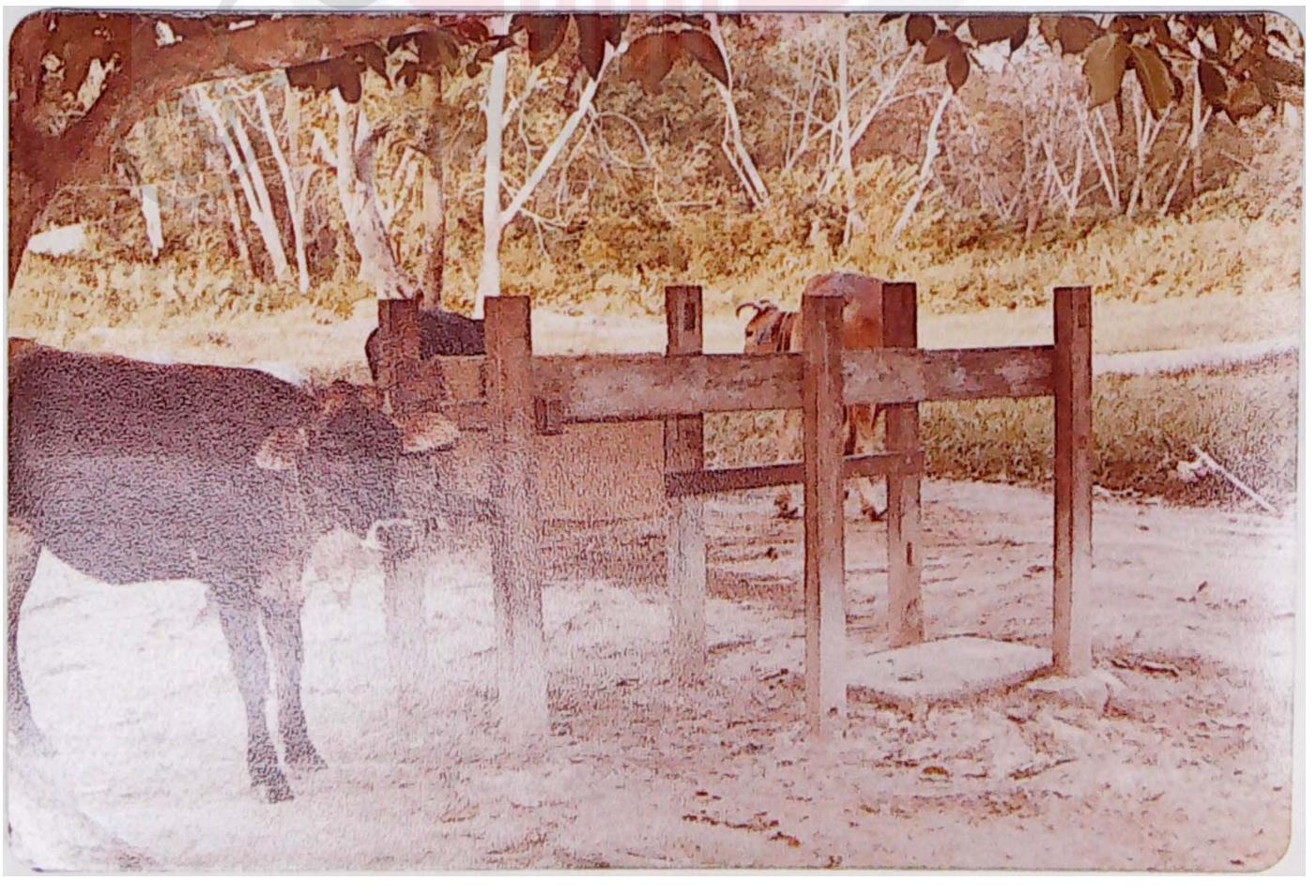


5. (Above) Th c lf is suckl· to stimulate milk l t-down Notice the calf on the right suckling the dam after m king is compl ted. I ote the water trough for s oPin water taken from wells.

6. (Below) The farmer m'lking his cow while the calf is tethered near the dam. A i ce of ope is used to restrain the hi d leg an a pie of wood i attac ed to a loo of icycle chain ai d to the side o reve t rov n idew ys. The small container besi the ail cont 'n cooking oil to l ricate th ets efore i kin ot farmer n 'lking s ool.

(Above) The farmer's calf-pen where the calves are housed and fed with cut grass till weaned. They are taken out only for suckling to let down milk. Grazing starts only after weaning.

8. (Below) The farmer's cattle holding area is under fruit tress, until time for grazing when he comes back from tapping rubber at noon. Notice the fairly reliable cattle crush.



SS

1. Cut and carry system using bicycle. F er cuts whatever grass is available (ven lallang, as sho above) and wherever available. Th's picture wa taken outside the M C office, Jasin.

2.

Motor-cycle of er better d faster w y of tran portation. Th e armer s abl to o o distances to collect as if there is a shor e during c son.

3. For roughage/grass supplement the armer has to plan ss or use padi-st w apart from collect' rass. The a ove pictur at Felda Kemendor, shows a farmer with his culti ated small p ot of grass. Land for grass cultivation is scarce but farmer can resort to padi-straw. e picture elow at Air 'olek shows padi- traw, stacked up or cat le feeding Fresh straw is seen in he fore round.

These pictures were taken · Tang k. Grass under rubber trees was sp yed with weedicide (Above), allowing no grazing.

8. Thi has resulted in rubber areas bared of ass in the interrows (shown below). Grass collection i. difficult in this area Farmers have to travel far to collec

CATTLE HOLDING

1. Ca tle holding are in a rubber estate (above) and 6il-palms estate (below). H re, in h morning cattle are tethered to osts driven into the ground until time for z in the afternoon.

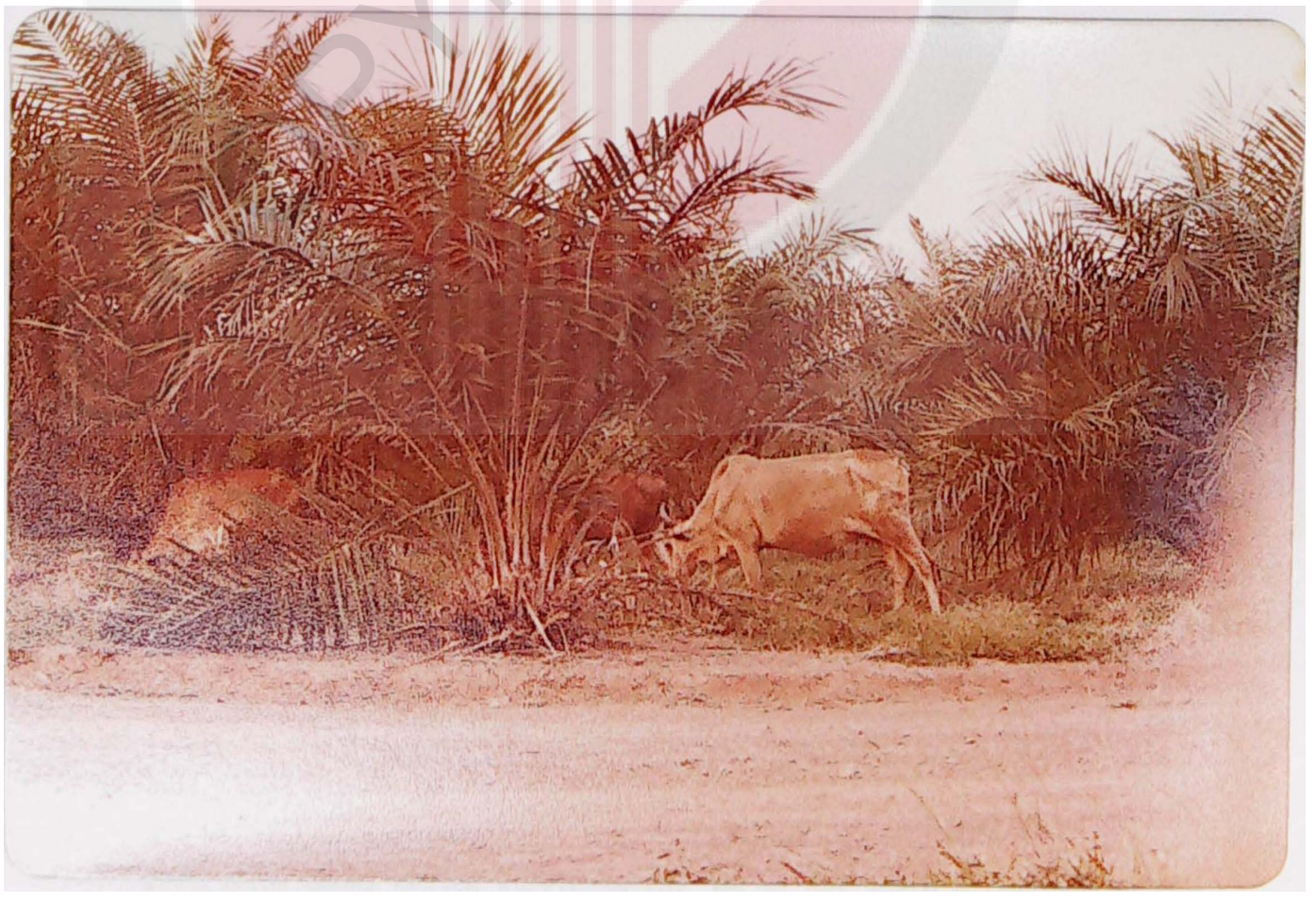
3. Cattle holding area in a Malay Kampung (village) at the right of the picture. Notice cattle being kept there under rambutan, durian and mango trees and coconut trees.

In the estates, where the area is open, cattle are kept indoors until time for grazing. Notice the disorderly, crowded and muddy conditions (the cattle 'ghetto' or "slum" area).

VI RAZ G A S

1. C ttle ei g graze col c ively der rub er tr e in an estat . erdwoman car see on he right (bov , .

. Picture below shows c t e being graz o palms. cattl a l o damage the oil-palms.



3. A coconut area where cattle are reared. But the ass is poor in quality. There is potential to improve the grass and stock animals. Notic the cattle crush on the right.

A pic ure taken Muar. Notice tl e abun ant grass along the nk o irrigation canal (which stretches for 3-4 miles) where f w cattle are g azing. This area ha po ential for catt rear g if the ri ht a proac is made y par ies concern in ivestock ev lopm nt.

Cattle are zed wherever there is green grass. The grazing area could be road-sides, under rubber trees (as shown above) or e en at a cementry (shown below).

6.

ESTATE'S
PROBLEMS.

- A e p drain (4ft 4ft d by an e· ate managem nt o prev nt cattl (s· s on th rig t) from grazing under th oil- lms.

- the cattle grazing un r rubber trees and the inner fencing the estate managemen o protect the young rubb r tr

Cattle shed an est te t the edge of the ru ler a oil alm areas.

Notice the ineffective and broken fencing and the damaged young oil palms caused by th c t l .

il p shown above af r being grazed cattl

The damage (wilting) of oil palm shoots caused by the rhinocer beetles which breed in the cattle dung. The estate management sprayed chemicals (DIPTREX) onto the cattle dung to control th breeding of the beetles.

VIII THE FUTURE PLANS.

Cultivation of tropical grasses under coconut trees

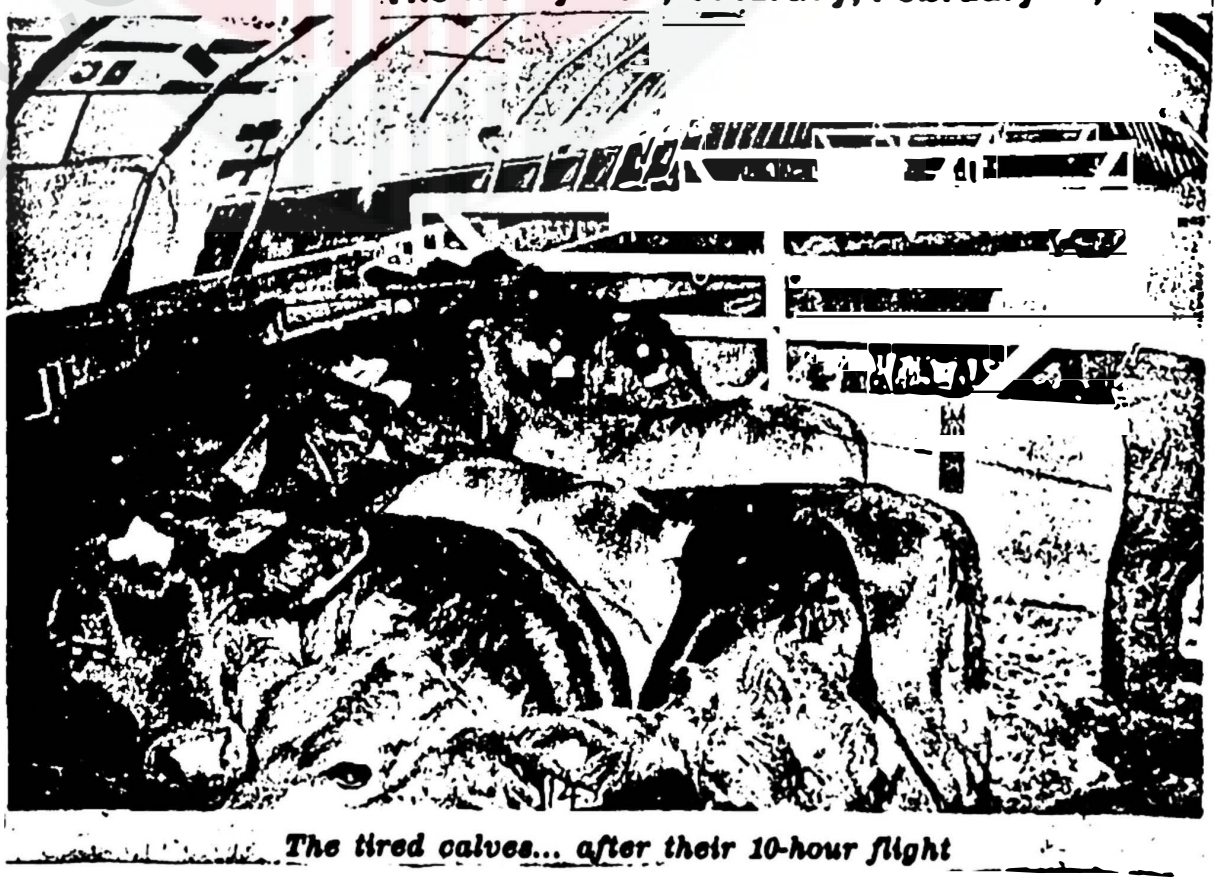
1. Above:

2. Below:

The 250 calves are the first batch of 11,500 6-month old crossbred heifers bought on contract from Australia and New Zealand.

VIPs rom Me¨ ourne

The Malay Mail, Saturday, February 25, 1978



The tired calves... after their 10-hour flight

APPENDIX E

SURVEY OF DAIRY FARMERS IN JASIN MCC Scheme

Name: ..... Age: .....

Occupation: ..... Dairying*(Part-time/Full time)

Adress: .....

Other (eduation, previous occupations, other present occupation: .....

.....

1. INTRODUCTION

a) (i) When started dairying ..... Informed of MCC by .....

(ii) Why chose dairying .....

(iii) Experience*(Cattle rearing/dairying). When .....

(iv) Training in dairying ..... Adequate*(yes/no)

Any suggestion .....

(v) Won any dairy competition*(yes/no) Explain .....

.....

b) Wife

(i) Occupation ..... Cooperation*(yes/no)

(ii) How she helped .....

c) Children

(i) No..... No. helping ..... Age helping .....

(ii) No. schooling ..... No. working .....

No. working & staying together .....

* Delete the incorrect

(iii) How the children helped .....

d) Other helpers

(i) Who ..... *(Hired/Not hired)

(ii) How they helped .....

e) Early experiences

(i) No. of beef cattle started .....

(ii) Age of beef cattle then .....

(iii) Origin of beef cattle .....

(iv) Other animals .....

f) Dairying

(i) No. of cattle started ..... Financial source .....

(ii) Origin of animals .....

(iii) State of animals then .....

(iv) Calving date after arrival .....

(v) Explain progress up to present .....

.....

(vi) Estimated man-hour on dairy cattle daily .....

2. Management Practices

a) Identification:

Explain .....

b) Post-natal care:

Umbilical .....

Other explain .....

c) Dehorning

(i) *(Prefer/Not Prefer) why .....

(ii) *(Willing to pay/not willing to pay).

SHED

a) (i) When lst built ..... Shed built later, when .....

(ii) Design ..... Design .....

.....

(iii) Dimensions of Shed:

1. Roof .....

2. Floor .....

3. Wood .....

Calf-pen .....

5. Grass feed trough .....

6. Water trough .....

Store .....

8. Drainage .....

Cattle Crush .....

10. Other .....

(iv) Who cleaned the shed ..... When .....

Control of insects

Explain .....

4. BREEDING

a) Heat detection

(i) Detected by ..... Notified MCC by ..... How .....

(ii) Time detected ..... Time notified MCC ..... Time AI .....

(iii) Signs of heat observed (1) mounting .....(.....)

(2) red, swollen vulva .....(.....)

(3) vaginal discharge .....(.....)

(4) restlessness .....(.....)

(5) bellowing .....(.....)

b) Insemination

(i) Days post-partum , cows supposed to be inseminated .....

(ii) When cows return to heat post-partum .....

(iii) Heifer, age at 1st insemination .....

(iv) *Aware/not aware of disadvantages of early mating.

(v) AI *(yes/no) No. of AI before using bull .....

(vi) Natural *(yes/no) explain .....

c) Bull

(i) No. ..... Breed ..... Ratio .....

(ii) *(Own/neighbour) Rent *(yes/no)

(iii) Age at 1st mating .....

(iv) Vasectomised bull as heat detector: *(Available/Not available)

(v) Control of bull *(yes/no) Castrated *(yes/no)

(vi) Male calves *(castrated/not castrated) Why .....

d) Pregnancy diagnosis

(i) How often ..... Who performed .....

(ii) Cows should be pregnant as soon as possible (60 days post partum), otherwise there will be a loss in future milk production:
*(aware/not aware)

RECORDS

(i) *(Has/None) why not .....

(ii) Type of record: *good/fair/not good/inadequate

1) birth date .....( )

2) birth weight .....( )

3) milk production .....( ) *(Individual/Group)

4) milk sales .....( ) (Daily)Max ..... Min .....

5) vet. medical record .....( )

6) AI/mating record .....( )

7) Purchase records

concentrate .....( )

molasses .....( )

salt licks .....( )

other .....( ) (State) .....

animals .....( )

8) Sales of animals .....( )

MILK PRODUCTION

a) Colostrum

(i) LID ..... days X-bred ..... days

(ii) If calf died .....

(iii) If dam died .....

b) Milking

(i) *Hand mil king/machinemilking

(ii) Before milking, were the cows bathed *(yes/no) (am/pm/both)

(iii) Suckled 1st by calf *(yes/no) Explain .....

(iv) Where milked .....

(v) Who milked ..... Time ..... am ..... pm

(vi) Milking time per cow ..... minutes.

(vii) Alternative milker *(yes/no) Who .....

If none, steps taken .....

(viii) Has cows ever not milked *(yes/no)

Why .....

(ix) Length of lactation LID ..... X-bred .....

1. Max yield (amount) ..... When .....

2. Min yield (amount) ..... When .....

3. Reasons for yield drop .....

(x) Has milk ever been rejected *(yes/no). Amount .....

Why .....

Duration ..... How often .....

(xi) Use of rejected milk:

1) drank by family ..... amount

2) given away ..... To who .....

3) made into milk products ..... State .....

4) other uses ..... State .....

c) Drying of cows:

(i) Time of drying

(ii) Explain procedures .....

d) Future Plan

(i) Increase stock *(yes/no)

Max. No. of cattle, explain ..... Breeds .....

(ii) Plan to increase stock

1. sell LID and buy X-bred .....(....)
2. buy X-bred *(Cash saving/credit) .....(....)
3. buy more LID, use AI to get X-bred .....(....)
4. Use existing LID use AI to get X-bred .....(....)
5. Use existing breeding animal only to expand ..(....)

(iii) Working Plan

1. work harder and cut more grass .....(....)
2. use more concentrate .....(....)
3. increase man-power .....(....)
4. expand shed .....(....)
5. use milking machine .....(....)

7. FEED

a) Water

(i) Source ..... *(ad lib/regulated). Time .....

(ii) Quantity .....

b) Molasses

(i) *(yes/no). Quantity/animal, explain .....

(ii) Quantity/month .....

c) Concentrate

(i) *(yes/no) Source .....

(ii) Time of feeding ..... method *(mash/slurry)

(iii) Quantity per head per day

1. Bull .....
2. Dry cow .....
3. Milking Cow .....
4. Pregnant Cow .....
5. Calves .....
6. Heifers/yearling .....

(iv) Quantity per month ..... Problem of late supply *(yes/no)

(v) Attempt to stock *(yes/no), explain .....

d) Other supplements

Explain .....
.....
.....

e) Salt & minerals

*(Salt lick/common salt) Quantity .....

f) Grass

(i) Cut & Carry:

*(yes/no)

(ii) Who cut ..... *(daily/alternate days). Time .....

If rains *(cut/did not cut)

(iii) Sources .....

(iv) Distance ..... Transport method .....

(v) Quantity ..... Quality & type .....

(vi) Time of lack of grass ..... Alternative feed .....

When used.....

g) Grazing

(i) Holding area .....

(ii) Method of grazing *(free to roam/looked after/tethered)

(iii) Time out ..... Time in ..... Distance (to & fro) .....

(iv) Who looked after .....

Alternative person .....

(v) Type of grazing ground .....

Type of terrain .....

(vi) Cooperation : estate, explain .....

neighbours, explain .....

(vii) Injuries while grazing, explain .....

(viii) Any grazing reserves or pasture establishment .....

.....

8. EXTENSION ON DAIRYING

a) Information:

(i) What type of information given .....

(ii) Who gave ..... How .....

(iii) When ..... How often .....

(iv) *(Adequate/Not adequate)

(v) What other information required or should be given explain .....

.....

(vi) Information in mass media, explain:

1) newspapers .....

2) magazines .....

3) pamphlets .....

4) Radio .....

5) T.V. .....

b) Confidence in the scheme

(i) Are you confident you would be successful *(yes/no). If not why

.....

(ii) Who will take over .....

(iii) Do you think if more people knew about the benefits of the MCC scheme more would join scheme, considering 1) market is stable, 2) Credit is available, 3) high yielding X-bred can be purchased, 4) the know-how is taught (available).

*(yes/no)

iv) If otherwise, why .....

.....